OBSERVING THE PUBLIC REALM IN BROOKLYN:
EXPLORING DIGITAL ANALYSIS TECHNIQUES FOR PUBLIC SPACES

A Research Paper

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by

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ABSTRACT

This paper expands discourse and methodologies for the scientific study of urban public spaces. It presents an analysis of observational data collected for the Fulton Area Business Alliance in Brooklyn, NY. Over the summer of 2013, two park spaces in Brooklyn were observed to determine the volume of use, the types of users, and the clustering patterns within the space. Spatial statistical analysis is performed to detect hot spots of activity. The study demonstrates that usage trends can be discerned through direct-observational techniques, and that fine-grain GIS analysis can assist in the formulation of and justification for new designs.

BIOGRAPHICAL SKETCH

Daniel W Moran is an urban planning professional and social scientist. Daniel is interested in the application of advanced spatial techniques and geographic information systems to the study of urban spaces. He has five years of experience in quantitative research, and two years of experience working within the context of urban planning and development. Daniel is receiving his Master's degree in Regional Planning from Cornell University (January 2015). He also holds a Bachelor's degree from Skidmore College (2007), with a double major in Classics and History.

ACKNOWLEDGMENTS

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1 INTRODUCTION AND REVIEW OF PRECEDENTS

Introduction

Urban planning and landscape architecture, unlike their sister field of architecture, are concerned with the spaces *between* buildings.[1] While architects produce buildings that are ergonomic and well-appointed on the inside, and that are attractive and integrative from the outside, the architect's ability to define exterior space is confined to the plot in which their building is constructed. Further, while architects engage largely in the construction of private edifices, owned or managed by individuals or organizations who restrict access at their discretion, planners engage with the unrestricted *public realm*, and, to boot, the *natural environment*. Although architects can incorporate naturalism into the fabric of the building, and employ innovative methods to bring the outdoors in, the open air is the realm of the planner who helps manage the use and allocation of such common resources. It is up to landscape architects and planners to adjudicate the use of the *space between*, whether it is a streetscape or a public park. But while landscape architects are commissioned often to produce meaningful designs for public plazas and gardens, it is primarily the realm of the planner to guide the use of these spaces, and to ensure they produce ripples of positive effects for the community locally and at large. With such a sweeping mandate, it is the planner's responsibility to better understand our common resources, and to employ technologies in understanding them that are as innovative as those used by their better-compensated colleagues, the architects and engineers. This paper attempts to advance the scientific study of public space, in hopes that planners can better study our spaces and devise design interventions that are backed by empirical data.

Public space analysis is the science and art of measuring human interactions with the physical space around them, and conversely of understanding how spaces are defined

[1] Jan Gehl, *Life between Buildings: Using Public Space* (New York: Van Nostrand Reinhold, 1987).

by the activities that take place within them. Multiple disciplines have developed methodologies for studying people and their relation with space: anthropology, architecture and landscape architecture, urban planning, and even business and marketing.[2] Recent advancements in geographic information systems (GIS), global positioning systems (GPS), and other computer-aided geographic programs, have provided the opportunity to look at space with a level of detail and precision previously impossible. In fact, information-driven design has become a focus of many professions, from information science, to design, to real estate, to geography. Scientists affiliated with ESRI have declared "*geodesign*" a new discipline of study, and believe that GIS can aid to simulate and test design scenarios at every scale.[3]

Not only is it the planner's responsibility to study park spaces to understand their impact on community members, the study of parks has been validated economically by empirical evidence that park spaces have a positive effect on proximal real estate values, as demonstrated by J.L. Crompton in 2001.[4] Crompton shows, based on evidence from 30 empirical studies, that park spaces can have "a positive impact of [approximately] 20% on property values abutting or fronting a park," and that parks may serve to increase property values two to three blocks away by as much as 10%.[5] Spaces devoted to general (passive) use (as opposed to active recreational use, such as ball games), are especially effective in driving up real estate values. Data from the NYC DOT further validates this information. In 2012, the DOT reported in its publication, *Measuring the Street*, that businesses adjacent to newly-installed pedestrian plaza spaces can realize significantly increased retail sales. For example, the DOT showed that businesses adjacent to the new

[2] Aydin Ozdemir, "Shopping Malls: Measuring Interpersonal Distance Under Changing Conditions and Across Cultures," *Field Methods* 20, no. 3 (August, 2008).
[3] William R. Miller, *Introducing Geodesign: The Concept* (Redlands, CA: Esri, 2012).
[4] John L. Crompton, "The Impact of Parks on Property Values: A Review of the Empirical Evidence," *Journal of Leisure Research* 33, no. 1 (2001): 1-31.
[5] Crompton, "The Impact of Parks on Property Values," 29.

Pearl Street Plaza in DUMBO, Brooklyn, showed increased sales of 172%, as compared to 18% growth borough-wide.[6]

Public Space Studies: Precedents

Long before the study of open spaces was established as an economically *smart* thing to do, planners and architects took on the issue as a matter of public interest. Perhaps the progenitor of scientific analyses of open spaces is the urbanist and organizational theorist, William H. Whyte. In his famous 1980 book, *The Social Life of Small Urban Spaces*, Whyte applied a series of methodologies to assess public spaces in New York City, most notably the Seagram Plaza in Manhattan.[7] In his work, Whyte looks at the implications of various park design choices on how, and how much, parks are used. He considered metrics such as shade and seating availabilities, the presence of water features and food vendors, and the social implications of inevitable "undesirables," i.e. the homeless and mentally ill. Whyte was perhaps first to apply and widely publicize hard methodologies for the study of open spaces, and his findings were at once obvious and profound. Whyte famously concluded that, "People like to sit where there are places for them to sit," and noted that more interactive spaces produced a greater diversity of use. Whyte's studies brought to attention the fact that spaces need to be intentionally designed for human use, or they will lie desolate.

Among Whyte's various methodologies was a planar, 2-D diagrammatic analysis of where people are likely to locate within a park. Employing the 'stop plot' shown below in his analysis of Seagram Plaza, Whyte showed that individuals locate toward to the edges of the space, rather than toward the center. Such a finding suggests that hidden

[6] New York City Department of Transportation. *Measuring the Street: New Metrics for 21st Century Streets.* November, 2012. Accessed August 13, 2014, pg. 7. http://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf.
[7] William Hollingsworth Whyte, *The Social Life of Small Urban Spaces* (Washington, D.C.: Conservation Foundation, 1980).

beneath the mask of a popular common space are trends of human behavior: preference for the security of edges and boundaries, respect for rights-of-way and traffic efficiency, the desire to sit and rest rather than to stand. Though the findings were at the time significant, by today's standards the stop-plot was crudely rendered. Box-grid technology today is succeeded by *point pattern* data, rendered within geographic information systems (GIS) software, in which a collection of precise X-Y coordinates can be analyzed in geographic space. Though Whyte's foundational work was completed in the 1980s, his legacy lives on, notably through the organization, *Projects for Public Spaces* (PPS), a nonprofit based in New York City that provides *placemaking* consulting and advocacy services for cities around the country.

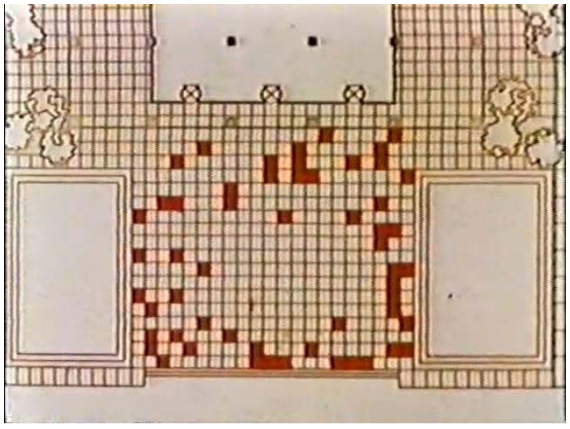


FIGURE 1.1: WILLIAM H. WHYTE STOP-PLOT DIAGRAM
This stop-plot diagram from Whyte's The Social Life of Small Urban Spaces displays data collected on the location of stationary individuals in the popular Seagram Plaza in Midtown Manhattan. Whyte found that people's location patterns could be predicted, and that they responded to physical characteristics of the park.

Currently within the field of urbanism, the forerunner of public space analysis is Danish architect and urban planner, Jan Gehl. Gehl has perfected a methodology, based on quantitative *pedestrian counts* and qualitative *public life assessments,* which he employs in the examination of public space networks in cities around the world. Gehl discusses his methodology for public space analysis in a number of works, including *How*

to Study Public Life (2013), and *Public Spaces, Public Life* (1996). Gehl calculates volumes of stationary users at public spaces, supplementing this data with counts of pedestrian passers-by. He records demographic and activity data, and has devised a series of controls that include the sampling of observations only on fair-weather summer days, at peak hours during the week.

In 2012, Gehl was contracted by the NYC DOT to re-envision the use of New York's extensive street network. His initial examination of the city's public realm produced the publication, *World Class Streets: Remaking New York City's Public Realm*, which is both an assessment of and re-imagination of New York's auto-friendly street network. Gehl's recommendations included expanding space allotted to bikers and pedestrians, encouraging the closure of streets to auto traffic during "walk-and-bike-the-streets" events, and regulating buildings' use of scaffolding and metal grate security doors that produce a forbidding urban environment. Significantly, Gehl's work with the DOT led to the creation of the NYC Plaza Program, and he continues to consult on projects like the recent East Midtown rezoning proposal. The NYC DOT utilizes Gehl's methodology in its own evaluation of the plaza spaces.[8] For each pedestrian plaza it creates, the DOT collects data before investing in permanent design infrastructure. The DOT collects such information as the ratio of males to females, the number of plaza users seated as individuals or in groups, and the types of activity users are engaged in.

The DOT also employs direct survey techniques, asking park users whether they perceive the spaces as safe, whether they appreciate the space's aesthetics, and whether they'd like to see them become permanent. The technique most innovatively used by both Gehl and Whyte is called "direct observation." *Direct observation* refers to the act of

[8] New York City Department of Transportation. *Fowler Square Post-Implementation Analysis*, December 18, 2012. Accessed August 13, 2014. http://www.nyc.gov/html/dot/downloads/pdf/2012-12-fowler-square-cb2.pdf.

visiting a space and unobtrusively observing the people and events taking place there.[9] The methodology is discussed in the literature within a variety of fields, and is employed widely, from the evaluation of humanitarian aid programs (Kumar, 1987), to the anthropological study of social groups (Spradley, 1980; Patton, 1990), to the evaluation to consumer dynamics in shopping malls (Ozdemir, 2008). Direct observation is a passive intervention, requiring no interaction with the subjects observed, and no interference with the activities taking place. Direct observation is employed especially widely by anthropologists, and has led to the development of sub-disciplines such as *proxemics*, the study of personal space dynamics. Direct observation enables the investigator to study a phenomenon in its natural setting,[10] and provides a rapid and low-cost means of collecting data that could not otherwise be obtained. Direct observation requires a systematic methodology, and the researcher must utilize precise survey instruments, and collect data carefully with a well-trained team of researchers. Direct observation studies can be subject to observer bias, and for this reason it is best to employ a team of observers, rather than rely on the perspectives of a single scientist. Direct observation must be carried out discretely so as not to skew results by impacting the behavior of the subjects under observation. This phenomenon of 'sabotaging' one's own research results through observer obtrusion is called the "Hawthorne effect,"[11] and can be combatted by training observers to collect data quickly and subtly.

Data collected through direct observation can be comprised of a mix of qualitative and quantitative variables. Sheer numbers of people observed are collected, but attributes can be assigned to each observation, such as age, ethnicity, gender, and mode of activity. Increasingly, location (spatial) information can be appended to each data point, and

[9] Ellen Taylor-Powell and Sara Steele, "Collecting Evaluation Data: Direct observation" (Madison, WI: University of Wisconsin Cooperative Extension, 1996).
[10] Krishna Kumar, "Rapid, Low-Cost Data Collection Methods for A.I.D.," in *A.I.D. Program Design and Evaluation Methodology Report No. 10* (Washington, D.C.: United States Agency for International Development, 1987), 29.
[11] Henry A. Landsberger, *Hawthorne Revisited: Management and the Worker: Its Critics, and Developments in Human Relations in Industry* (Ithaca, N.Y.: Cornell University, 1958).

observations analyzed relative to one another in time and space. In this way, movement patterns can be observed, crowding and stampeding phenomena analyzed, and relationships between people and inanimate objects deduced. Digital technologies can also help capture this data. Time lapse cameras, infrared heat-sensing cameras, digital car and bicycle counters, can all be used to assess volumes and even movement patterns in open spaces. But in the realm of public space analysis, direct observation may still be the most flexible and efficient—and least expensive—way to capture information.

The Present Study: Goals and Objectives

This research paper stems from work commissioned by the Fulton Area Business (FAB) Alliance, a Business Improvement District (BID)[12] in the Borough of Brooklyn. A BID is a "public/private partnership in which property and business owners elect to make a collective contribution to the maintenance, development, and promotion of their commercial district."[13] Incorporated in 2009, FAB is one of 68 New York City BIDs, and serves more than 400 small businesses. FAB's annual operating budget is $300,000, and it employs one full-time staff member, Executive Director Phillip Kellogg, and two part-time staff members to provide a remarkable array of services to the community. FAB provides ancillary security services within its service district, manages street sanitation efforts, markets the business district both within the local community and regionally, and oversees the development of a public space network. In a recent initiative, the FAB Alliance partnered with the Brooklyn Academy of Music to

[12] BIDs collect assessment fees from businesses within a defined area and use this operating budget in the service of the local community, particularly with an eye on economic development. New York City has incorporated 68 BIDs within the five boroughs, the most of any city in the world, and these BIDs are overseen by the NYC Department of Small Business Services (SBS). The SBS website claims these BIDs collectively "contribute $80 million in supplemental services to more than 64,000 businesses," and "over $105 million annually in programs and services for neighborhoods across the five boroughs." The NYCBID Association's motto is "Enrich. Invigorate. Beautify," and to this end the city's BIDs engage in placemaking and the development of public spaces.

[13] "Business Improvement Districts (BIDs)," New York City Department of Small Business Services Neighborhood Development webpage, copyright 2014, accessed August 13, 2014, http://www.nyc.gov/html/sbs/html/neighborhood_development/bids.shtml.

successfully petition for a grant to provide free wireless internet service in its public areas.

A main objective of the FAB Alliance is to promote economic growth within its service area. The leadership at FAB has recognized it has a tremendous stake in the area's public spaces, since a functional public space network serves to increase pedestrian traffic, provides venues for events and programming, and enhances the desirability of the neighborhood. To explore the current use and potential redesign of its public spaces, FAB sponsored a series of observational studies in 2013. These studies included a *pedestrian count* at key intersections throughout the district, a *public life survey* of patterns of use within two FAB open spaces, and *oral and written surveys* of merchants and community members to gather feedback on physical developments within the district. Armed with this data, the FAB Alliance could better represent to its partner agencies (the NYC Departments of Transportation, Small Business Services, and Parks and Recreation, among others) its hopes for the future development of these spaces. The data presented within this report is the product of the *public life survey*.[14] The main goal of the plaza survey was to understand the following questions: To what degree are FAB's open spaces used by the community? By whom are these spaces used, and when? What activities take place at these spaces, and where is this activity clustered?

A secondary goal for this Exit Project was to understand the manner in which park use is predetermined through urban design. To focus efforts and resources, two spaces were chosen for closer investigation—Cuyler Gore Park and Putnam Triangle Plaza. Cuyler Gore Park is representative of 1980s-era New York City parks, with fixed benches, curated landscape areas, canopy trees, and programmed activity areas. Putnam Triangle, by contrast, is representative of the 21st-century urban plaza: "pocket-sized," informal, and interactive. A primary hypothesis was that clustering corresponds to

[14] Results from the other studies have been published previously, but are referenced as necessary in the present study.

programmed areas and seating areas within the two parks, and that observed activities would correspond to the limitations of the space in each park. Another hypothesis was that the programmatic design of older parks like Cuyler Gore would create highly segmented spaces, with clusters of activity found near benches and the playground area. In Putnam Triangle, however, a hypothesis was that the open and flexible design would result in greater dispersion. Park users would adjust the space to fit their needs, moving chairs to take advantage of shade and create spaces of privacy.

2 FULTON STREET AND ITS PUBLIC SPACES

The Neighborhood

FAB resides within the neighborhoods of Clinton Hill and Fort Greene, two fast-gentrifying neighborhoods in central Brooklyn. Its area of impact includes the storefronts and public areas along Fulton Street from Flatbush Avenue east to Classon Avenue. Fulton Street cuts east-west through Brooklyn from Borough Hall to the Brooklyn Bridge Boulevard. Running parallel to the automobile thoroughfare, Atlantic Avenue, Fulton Street is one of the most important pedestrian streets in Brooklyn. Fulton Street travels through a number of neighborhoods and carries the A/C MTA Subway line underneath. FAB is sandwiched between two other very active BIDs centered on Fulton Street. Directly west of the FAB Alliance, the Fulton Mall Improvement Association (another BID) manages the Fulton Mall district. Directly to the east, the Bed-Stuy Gateway BID manages Fulton Street within the neighborhood of Bedford-Stuyvesant. FAB's area of influence is thus constrained to a small slice of Fulton Street, and it competes with nearby neighborhoods to attract businesses, shoppers, and residents.

The FAB district lies in close proximity to a number of significant Brooklyn attractions and to a number of large-scale developments. At the west end of the district is the Brooklyn Academy of Music (BAM). Founded in 1861, BAM is the anchor of the "Downtown Brooklyn Cultural District"[15] and claims to be the oldest arts center in America. BAM is an educational and performance venue for theater, dance, music, film, and other art media. South of the FAB district is the new Barclays Center, a multi-purpose arena, home to the Brooklyn Nets, that houses over 18,000 seats.[16] Opened in 2012, Barclays anchors a transit-oriented development project centered around the

[15] "Downtown Brooklyn Cultural District," New York City Economic Development Corporation Projects webpage, last modified July 3, 2014, accessed August 9, 2014, http://www.nycedc.com/project/downtown-brooklyn-cultural-district.
[16] "Barclays Center Seating Chart," Barclays Center Latest Events & Info, copyright 2014, accessed August 13, 2014, http://www.thebarclayscenter.org/barclays-center-seating-chart/.

MTA's Atlantic Avenue station, with connections to the NYC Subway and the Long Island Railroad. The Barclays Center is the site of fifteen residential towers under development that will add thousands of units of residential housing stock on FAB's doorstep. Also in proximity to the FAB district are a number of cultural, historical, and natural areas, including Prospect Park, Fort Greene Park, the Brooklyn Navy Yard, and the Brooklyn Flea Market.

Within the FAB District, additional development projects are contributing an influx of permanent residents and day workers. At "66 Rockwell Place," close to BAM and Flatbush Avenue, a 47-floor, 327-unit residential tower began filling with tenants in the winter of 2013. "BAM North" and "BAM South" are two nearby projects projected to produce an additional 900 residential units by 2016. Two cultural venues, the Theater for a New Audience and BRIC, opened within the Downtown Brooklyn Cultural District in 2013. At the center of the FAB district, at Vanderbilt Avenue, a new office building opened (470 Vanderbilt Avenue) in the spring of 2013. At 100% capacity, the building is hosts an estimated 5,000 workers and visitors per day, representing a huge new market for restaurants and businesses nearby.[17]

[17] Phillip Kellogg, *Fulton Area Business Alliance Annual Report of Accomplishments and Goals, Fiscal Year 2013* (New York, NY: Fulton Area Business Alliance, November 22, 2013), 1.

FIGURE 2.1: FAB DISTRICT BUILDING FOOTPRINTS
This figure-ground diagram shows the buildings along Fulton Street occupied by FAB businesses. Note some of the buildings are not strictly on Fulton Street, but rather on a side street a block away. The commercial buildings gradually fade into the residential fabric of the streets behind.

The Public Spaces

Fulton Street cuts across Brooklyn's rectangular grid at an angle, and at the intersections of certain streets the roadbed surrounds little islands ("triangles") of undeveloped land. Beginning in 2010, FAB has partnered with the NYC DOT to develop pedestrian plazas at these triangular spaces through the NYC Plaza Program.[18] The NYC Plaza Program functions by closing off once-active roadbeds and installing in their place pedestrian-only areas. At first, the plaza spaces are informal and temporary—rock features and planters provide landscaping and visually separate the space from the

[18] The NYC DOT, as perhaps the largest landlord in the city, controlling the 25% of the city's land surface dedicated to roads (source: DOT website, http://www.nyc.gov/html/dot/html/pedestrians/public-plazas.shtml), has established the NYC Plaza Program, in consultation with Gehl Architects, to activate more of this space for non-automobile use. Perhaps the most notable of these plaza spaces is at Times Square in Manhattan, but other successful plazas have been created in four out of five boroughs (Staten Island excluded).

roadbed; moveable chairs and tables provide places to sit and gather; a white asphalt spray coats the street bed to suggest the area has been cordoned off for pedestrians. If the plaza is successful, a more permanent design is installed. Landscaping and furnishings are installed and adapted to the space in question, and the design is carried out in consultation with local community members and partner organizations.

The FAB district currently is home to two DOT plazas. The first space to be outfitted was Fowler Square, an 8,400 square-foot plaza at the intersection of Fulton Street, Lafayette Avenue, and Elliott Place. Fowler Square anchors the trendy Fort Greene shopping district, and has proven to be a popular plaza, with the highest approval rating of any plaza across the city.[19] Fowler Square is now in the redesign process for a permanent reconfiguration, and ground should be broken in 2014.

In December 2012, the DOT announced that Putnam Triangle would become the second NYC Plaza within the FAB district. Putnam Triangle, servicing the eastern portion of the FAB district, has proven to be an important gathering space for community groups and residents of Clinton Hill. Putnam Triangle was outfitted with temporary furnishings in 2012, and has not yet undergone a redesign process to ready it for permanent installation. For this reason the FAB Alliance targeted the space as a subject for its public space survey. The FAB Alliance hopes to understand the usage conditions under which a redesign of the space should be considered.

Putnam Triangle

Putnam Triangle Plaza is a 17,000 square-foot space at the intersection of Fulton Street, Putnam Avenue, and Grand Avenue. Putnam Triangle is a classic DOT Plaza, with moveable chairs, tables with umbrellas, granite boulders and planters that provide seating and decoration. The flooring of the park is entirely concrete, with the exception

[19] New York City Department of Transportation, *Fowler Square Post-Implementation Analysis*, December 18, 2012.

of a small fenced garden. The plaza is quite hot; shade is provided by a few small street trees, and by large blue umbrellas that are opened each morning and folded away each night by FAB employees. There is a bus stop along Fulton Street that carries passengers west to downtown Brooklyn.

Putnam Triangle is lined on two sides by street frontage, and on the third side by storefronts. A convenience store, three restaurants, a laundromat, and a clothing store front onto the park. Aside from some affixed benches lining the sidewalks, the seating at Putnam Triangle is completely mobile. Twenty to thirty moveable, foldable chairs are scattered around the park, and park users adjust these into the shade of trees, along the side of buildings, and gather them around tables for games, conversation, and food. Some park users consume take-out food from the adjacent food establishments, and others wait in the plaza for their laundry. Putnam Triangle is not child-friendly, since it is very small and exposed to the street, but the openness of the park allows for a variety of uses. One would think the lack of shade and programmed spaces renders this plaza best for short visits, but it has proven to be widely used over long periods by groups of community members.

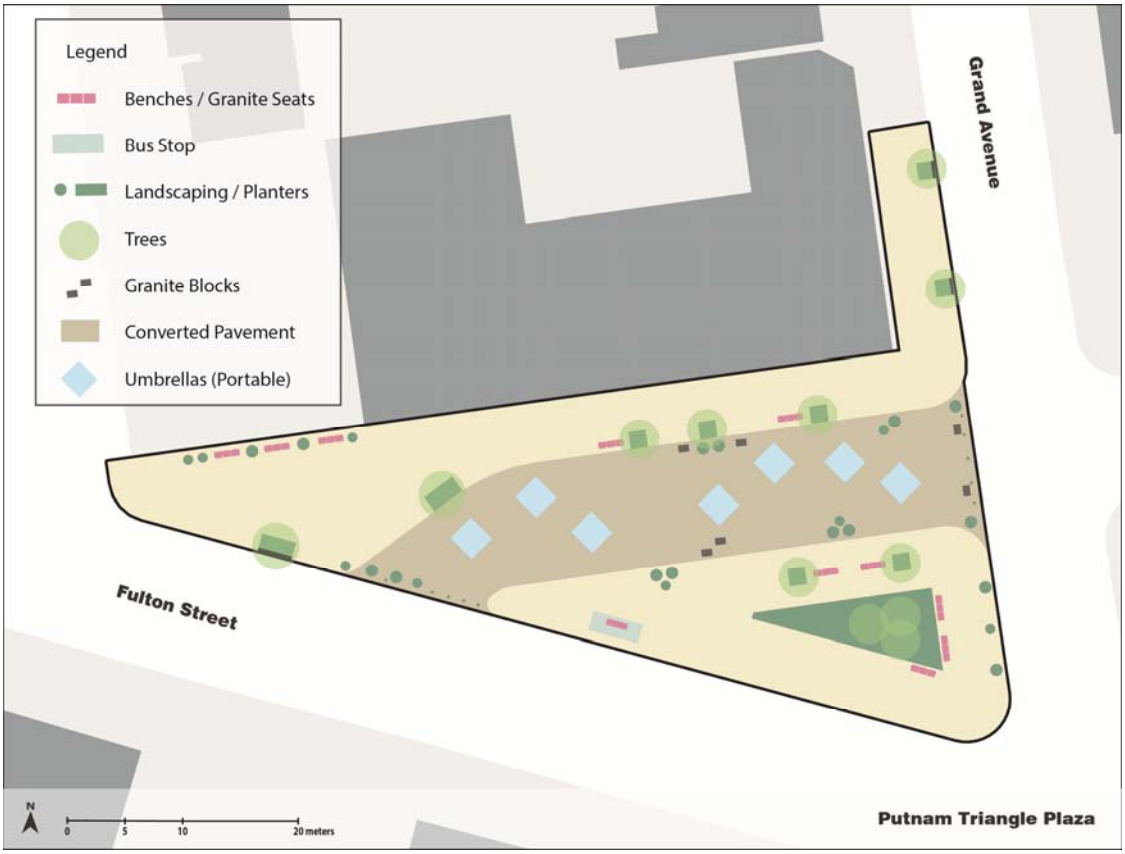


FIGURE 2.2: PUTNAM TRIANGLE PLAZA PHYSICAL FEATURES

Putnam Triangle Plaza is a classic NYC DOT plaza, with portable planters, chairs, umbrellas, and rock features.

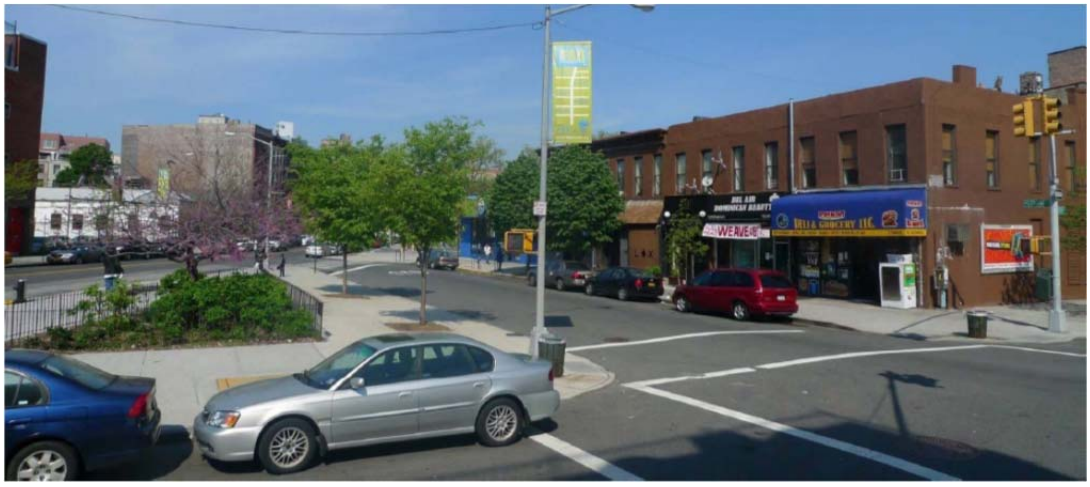


ILLUSTRATION 2.1: PUTNAM TRIANGLE STREETSCAPE BEFORE PLAZA TRANSFORMATION

Putnam Avenue was inefficient and underutilized as a connector street to Fulton Street. The pedestrian plaza is a better use of space.

Source: FAB Alliance website.

ILLUSTRATION 2.2: PUTNAM TRIANGLE STREETSCAPE AFTER PLAZA TRANSFORMATION 1
Umbrella-shaded seating areas in Putnam Triangle are popular social spaces.

ILLUSTRATION 2.3: PUTNAM TRIANGLE STREETSCAPE AFTER PLAZA TRANSFORMATION 2
Putnam Triangle Plaza abuts Fulton Street, but is cordoned off by traffic separator. The pavement is coated with a sandy asphalt spray.

Cuyler Gore Park

In addition to the DOT plaza spaces under construction, FAB is home to the triangular Cuyler Gore Park, owned and maintained by the NYC Department of Parks and Recreation.[20] Cuyler Gore Park is the largest open space in the FAB district at 73,000 square feet. It is enclosed by Fulton Street, Greene Avenue, and Carlton Avenue, and houses a playground, a performance stage, and a number of seated areas under the shade of large trees. Cuyler Gore, though not a city plaza, is under consideration for redesign in the coming years. There are numerous community concerns about the safety and functionality of the park, and clamors to modernize it. As such, FAB has also identified Cuyler Gore as a subject of the public life survey, and hopes data will shed light on future uses for the space.

Designed in the 1980s, Cuyler Gore Park is a heavily planted, highly programmed space. Fenced off to the street and accessed through a series of interior promenades, Cuyler Gore is segmented carefully into distinct spaces. Cuyler Gore is much larger than Putnam Triangle, but much of the space (30,000 square feet, or 41%) is occupied by inaccessible green areas. The remainder of the park consists of bench-lined promenades; open concrete grounds; a jungle-gym play area; and a raised platform stage, which is used by FAB during its free community events. The park contains a water feature—four orbs that spray water—which is popular with the kids on hot summer days. There are two bus stops and a train station (servicing the Lafayette C-train subway) at the corner of the park where Greene and Fulton intersect.

The perimeter landscaping serves to push occupancy toward the center of the park, and the tree canopy leaves the park shaded most of the time. The park is entered through one of five access points: long walkways lined with trees and benches that lead to the open center of the park. Benches are offset so that seated parties do not face one

[20] A "gore" is a triangle park, referring to a triangular piece of fabric that is inserted into a garment to alter its shape. Source: http://www.nycgovparks.org/parks/cuylergorepark/history.

another directly, and trees between benches provide privacy and block communication. Though there is the option for sociability between benches, they seem to be designed for privacy, and to provide users with a private, restful space to view the trees and relax in solitude. The playground area is widely used by parents and daycare attendants who bring their children to the park during the day and evening hours. The perimeter fencing yields a safe environment for children. The stage area, useful for events and formal programming, is a dead space during off hours.

Community members have felt that the fenced green spaces at Cuyler Gore lend the park an unwelcoming, even forbidding, feel, and that a more open configuration would better attract visitors into the space.[21] FAB is working with the Parks Department to explore potential remediation of the space. Design proposals have included a modernized playground, thinned tree canopy, landscaped lawn, and a dog run. No street closures are being considered around Cuyler Gore Park, and there is no fixed timeline for this intervention.

FIGURE 2.3: PUTNAM TRIANGLE STREETSCAPE AFTER PLAZA TRANSFORMATION
Cuyler Gore is a 1980's era NYC Park, with a heavy tree canopy and programmed activity spaces.

[21] Fulton Area Business Alliance, *Draft Fulton Street Vision Plan*, pg. 15. Modified January 2013, accessed August 13, 2014, http://faballiance.org/sites/faballiance.org/files/draft_Fulton_St_VisionPlan_2013_01_14_www.pdf.

ILLUSTRATION 2.4: CUYLER GORE PARK ENTRYWAY

This photo of the entrance to Cuyler Gore Park at Greene and Fulton Streets demonstrates the leafy, overgrown aesthetic of the park, which some feel to be uninviting and even dangerous.
Source: NYC Department of Parks and Recreation website.
http://www.nycgovparks.org/parks/cuylergorepark/history.

ILLUSTRATION 2.5: CUYLER GORE PARK OPEN PLAY SPACE

The open interior grounds at Cuyler Gore Park are hemmed in by landscaping and trees. The park space is set apart from the urban streets surrounding it and is safe for children to play in freely.
Source: NYC Department of Parks and Recreation website.
http://www.nycgovparks.org/parks/cuylergorepark/history.

ILLUSTRATION 2.6: CUYLER GORE PARK PLAYGROUND
Playground space at Cuyler Gore Park is popular with parents and children, and a draw for local daycare facilities.

ILLUSTRATION 2.7: CUYLER GORE PARK BENCHES
Bench-lined walkways lead from the street to the interior of the park. Benches face one another but are distanced so as to provide privacy.

ILLUSTRATION 2.8: CUYLER GORE PARK WATER FEATURE
A water feature provides an activity center for playing children.

Community Feedback Surveys

The FAB Alliance uses local parks and plazas as venues for a variety of community concerts and events it hosts each summer, including concerts for children, music festivals, yoga and dance classes. Surveys of attendees at these events shed light on how the space is likely to be occupied during normal hours. A survey was taken in the summer of 2013 of attendees at FAB Friday events revealed these spaces are mainly used by people who live or work within walking distance. Less than half of attendees surveyed (42%) lived in FAB's immediate service area, the neighborhoods of Clinton Hill and Fort Greene. An additional 21% of attendees traveled to the event from Bedford-Stuyvesant, and the remaining 37% from Prospect Heights, Crown Heights, and other New York City neighborhoods. Second, survey results suggested that FAB park spaces are generally accessed by foot. It was found that 55% of event attendees had walked to the park space. An additional 26% of visitors had taken public transit, 12% had taken their car, and 5% had biked. During non-event hours it is likely the ratio of

walkers would be even higher, although the park spaces clearly benefit from their proximity to NYC Subway stations.

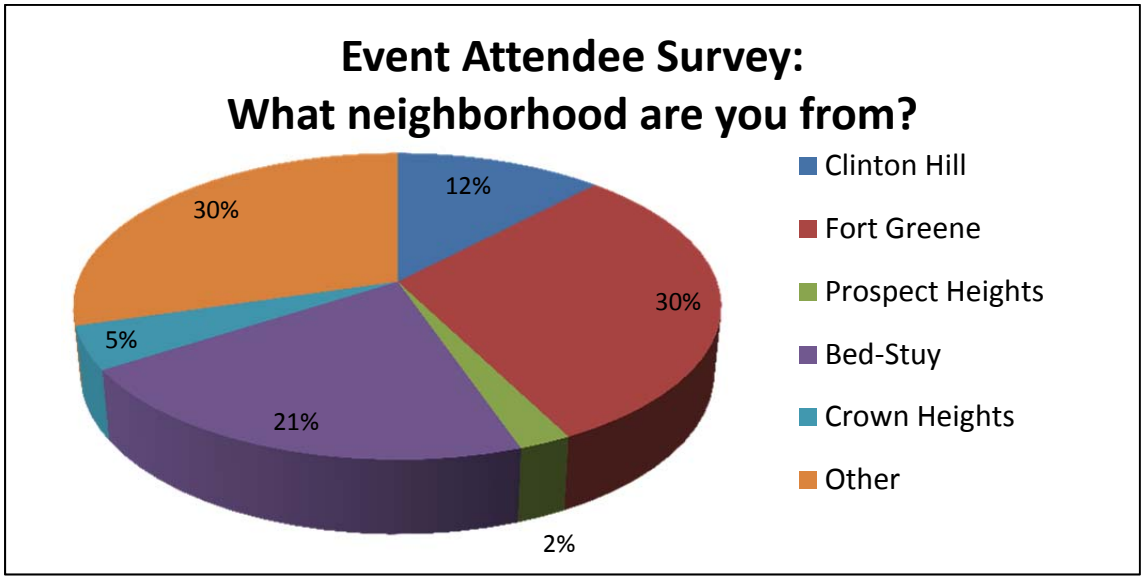


FIGURE 2.4: EVENT SURVEY QUESTION 1
Source: FAB Friday Survey Results, pg. 5.

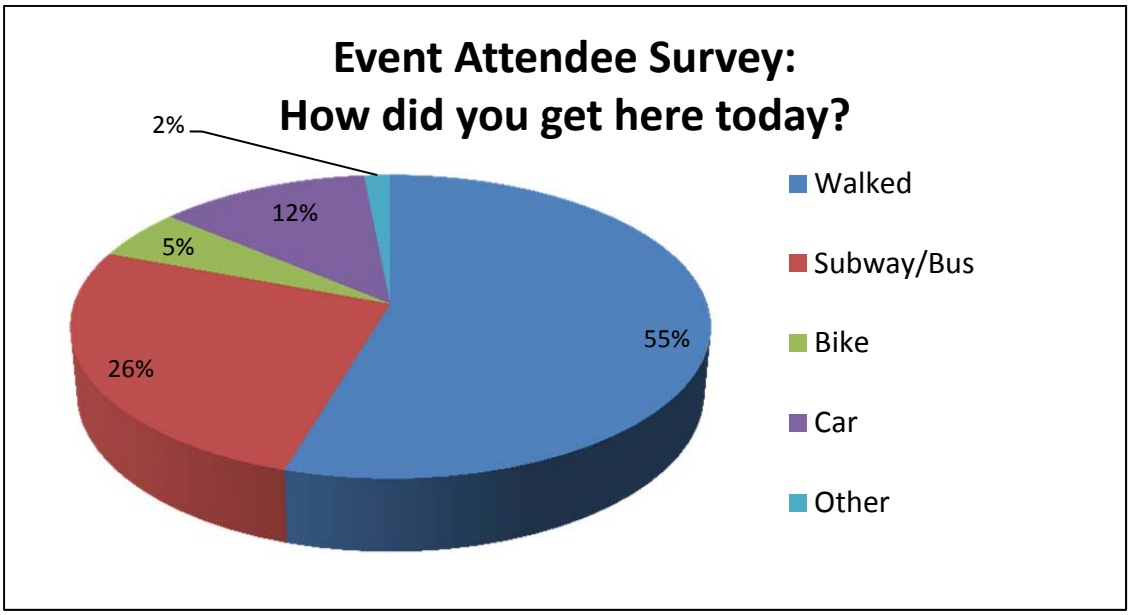


FIGURE 2.5: EVENT SURVEY QUESTION 2
Source: FAB Friday Survey Results, pg. 6.

Merchant Feedback Surveys

Businesses within the FAB district were surveyed in the summer of 2013 to gauge their reaction to physical developments along the commercial corridor, especially the new plazas at Fowler Square and Putnam Triangle.[22] The public space developments along Fulton Street are generally viewed favorably by businesses within the FAB Alliance, but not without some reservations. A great majority (70%) of merchants surveyed indicated they believed improvements to the physical realm were having a positive effect on their business. Food service businesses noted that customers would often order take-out food and sit in the park to eat. Some employees indicated that they used the plazas themselves to take their lunch and work breaks. Many merchants stated the open spaces transformed the district into a "destination" and increased staying power for shoppers and tourists.

Twenty-six percent of merchants indicated they felt the improvements to plaza spaces had no effect on their business at all, and 4% of merchants stated they believed the plazas were hurting business. One business noted that the plaza spaces were attracting loiterers, while another business felt the plaza improvements served to drive up prices in the neighborhoods and price out the traditional merchants. The survey of merchants revealed that while most believed the public space improvements to be a valuable, and even a necessary, component of the neighborhood's development, others were indifferent, and still others were hostile. In addition to the obvious benefits of additional recreation space, this park network is viewed by some as producing some negative externalities, namely suspicious activity and gentrification.

[22] Daniel Moran, *Fulton Area Business Alliance Merchant Survey: Report of Survey Results* (New York, NY: FAB Alliance, 2013).

FIGURE 2.6: MERCHANT SURVEY QUESTION 1
Source: FAB Friday Survey Results, pg. 5.

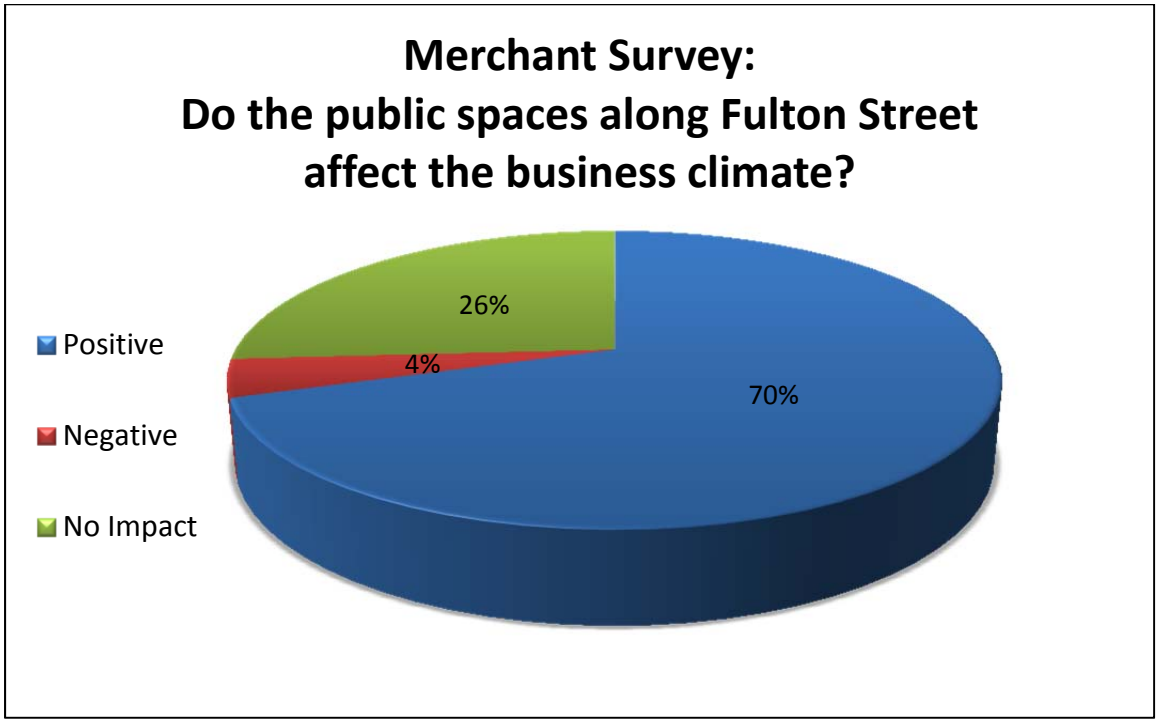


FIGURE 2.7: MERCHANT SURVEY QUESTION 2
Source: FAB Friday Survey Results, pg. 5.

3 METHODOLOGY

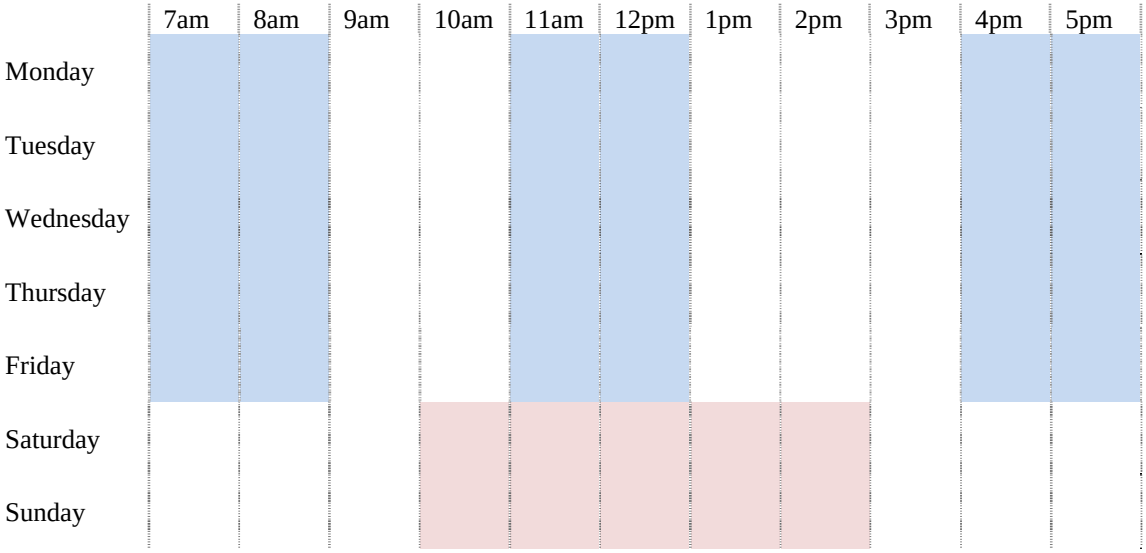
The study of these two park spaces was carried out over the course of two months, and data was collected by direct observation of *park users*.[23] Observers would walk through the park space documenting the number of park users, their activities, demographics, and locations within the space. Observers collected counts of individuals based on **age**, **ethnicity**, **gender**, and **activity**. For each individual it was noted whether they were **seated or standing**, and for seated individuals it was noted whether they were seated informally on "secondary seating" (i.e. non-traditional seats such as curbs, rocks, or the ground), or whether they occupied a wheelchair. The location of each park user was recorded on a paper map, and point data from the observation sheets was later geocoded into a scaled digital map within ArcGIS for analysis. Observers were instructed to note only *stationary* park users, i.e. people who were staying to occupy the space for a period of minutes at least. This protocol excluded persons merely passing through, while recording people were sitting, standing, or idly walking around the space. Altogether, five individuals helped collect data on this effort.

Data was collected during appointed peak hours on both weekends and during the week. On weekdays data was collected on Wednesdays[24] in the morning (7-9am), mid-day (11am-1pm), and in the evening (4-6pm)[25], while on weekends, data was collect during a block of time mid-day (10am-2pm)[26]. It was assumed that these blocks of time represent discrete periods of activity and are likely to have special usage patterns associated. Each site visit was carried out quickly, and was intended to capture a *snapshot* of the activity taking place at the appointed hour. Thus, the counts would

[23] Within the context of the current study, the people being documented are referred to as "park users."
[24] It was assumed Wednesday would represent average weekday traffic, being mid-week.
[25] These hours represented three distinct periods of activity: the morning rush, the lunchtime break, and the evening rush.
[26] It was assumed activity levels would be highest midday during the week, although results suggested that activity levels during the weekend continued to climb later in the day, and that late afternoon and evening hours might be even more popular. See 'Time Analysis' below.

represent activity *at any given time* during an hour, not the total number of people to occupy and use the space over the course of an hour. All site visits were conducted under fair-weather conditions. Time and weather controls were designed to capture park use data under ideal conditions: peak hours with fair weather in the summer. Thus, results provide an optimistic picture of the full potential utilization of the space; 24-hour usage volumes cannot be interpolated from this data.

TABLE 3.1 OBSERVATION HOURS



These are the hours in which data was collected. Observers visited each park space once during the hour to collect a "snapshot" of how many users were present.

The following table defines the data variables collected by observers. All definitions were established by the researcher.

TABLE 3.2 OBSERVATION CRITERIA AND DEFINITIONS

Activities	
Social Interaction:	People engaged in talking to other people. Did not include people talking on the phone.
Eating/Drinking:	People eating or drinking.
Solitary Activity:	People engaged in a solitary activity, such as reading, writing, working, using their phone. Did not include eating as a solitary activity.
Waiting for Transit:	People who seemed to be waiting for a bus or ride.
Child Activity:	Children playing in park, plus adults watching these children. Adults included parents, nannies, or childcare professionals.
***Physical Activity*:**	People engaged in physical activity, like tai chi, push-ups, juggling, etc. Did not count children playing in this category. Did not include people jogging or biking through the space in this category.
Passive Games:	People engaged in passive games, like chess, cards, etc.
Gender	
Male	Person appeared to be male
Female	Person appeared to be female
Race/Ethnicity	
White	Caucasian, European, or White American
Black	African or African American
Hispanic	At least partially Hispanic, with Latin American descent
Asian	East Asian, Southeast Asian, South Asian, or Middle Eastern
Unknown (Other)	Person's ethnicity could not be determined accurately
Age	
Child	0-12 years old
Teen	13-20 years old
Young Adult:	20-30 years old
Adult	30-65 years old
Senior	65 years old +

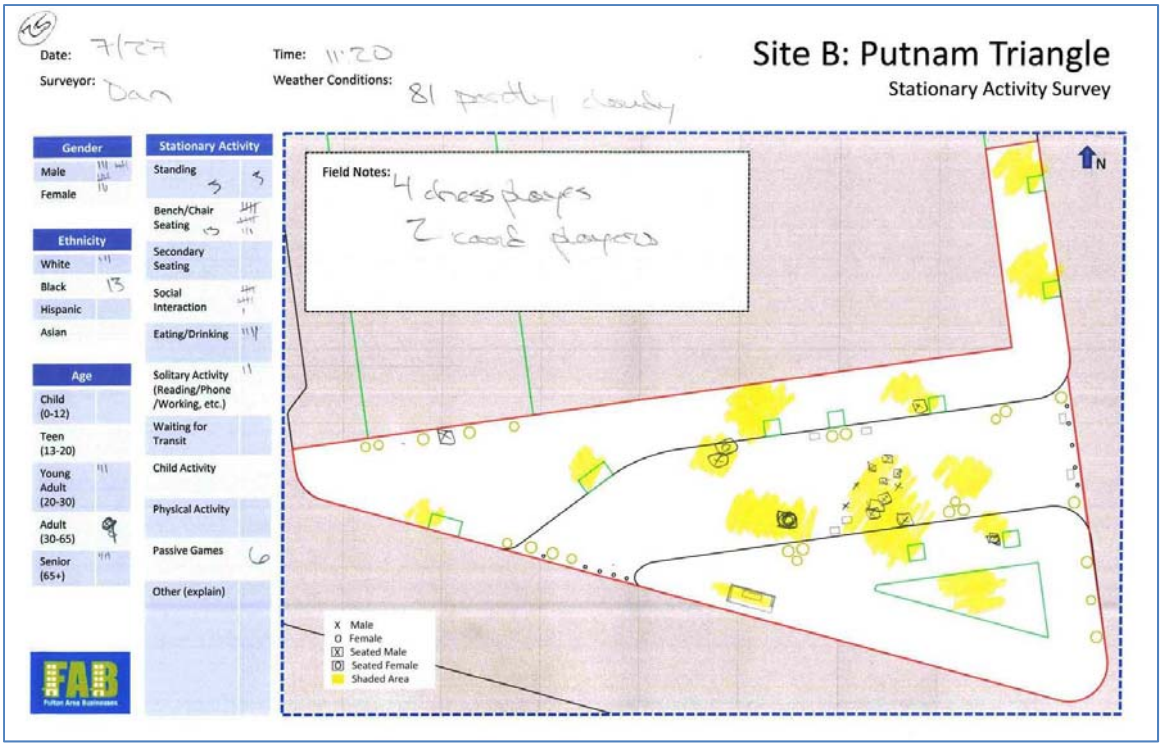


FIGURE 3.1: SAMPLE OBSERVATION SHEET

This is a sample of an observation sheet, completed by one of the observers. Location of males and females was denoted by X for males and O for females. Boxes were drawn around the X or O if the person was seated.

4 RESULTS & ANALYSIS

TABLE 4.1: GENERAL STATISTICS

	Cuyler Gore	Putnam Triangle
Total Number of Samples (Site Visits)	19	21
Male Count	205 (50%)	245 (71%)
Female Count	202 (50%)	100 (29%)
Total Count	407	345
Average Count per Sample	~21 people	~16 people
Accessible Square Footage*	30,000 sq. ft.	17,000 sq. ft.
Avg. Square Feet Per Person	3,476 sq. ft.	1,079 sq. ft.
***not counting fenced-off green space**		

The study yielded a dataset of 752 observations (people) counted over 40 visits (samples) between the two sites. The two park spaces exhibit different gender characteristics, with males making up exactly half of park users at Cuyler Gore, and over 70% of park users at Putnam Triangle. On average, about 21 people were observed using Cuyler Gore during each sample, and 16 people using Putnam Triangle. This statistic represents a higher density of usage at Putnam Triangle, where there was approximately one person per every 1,000 square feet. At Cuyler Gore, the space was less densely used with only one person on average for every 3,500 square feet. Overall clustering patterns at both parks showed a proclivity for park users at Cuyler Gore to cling to the bench spaces along the perimeter of the park, while at Putnam Triangle users were more likely to occupy the center of the park, pushing tables and chairs together to congregate in big groups.

Spatial Analysis of Clustering Patterns: The Kernel Density Function

To look for clustering patterns within the different park spaces, a kernel density function analysis was performed in ArcGIS to create "heat maps" of popular user locations. A kernel density analysis is a measurement of the probable density of

occurrences in a given study area based on a point-data sample set. A kernel density analysis requires a set of points (*a point pattern*), and a radius parameter with which to measure density (*bandwidth*). A circle around each point is drawn, and overlapping circles combine to form stronger "kernels" of density. The heat maps are thus interpolations of areas within the map where people are likely to cluster. Within ArcGIS, kernel densities are calculated based on the quadratic kernel function of Silverman,

$$\hat{f}(x) = n^{-1} \sum_{i=1}^{n} K_h(x - X_i)$$

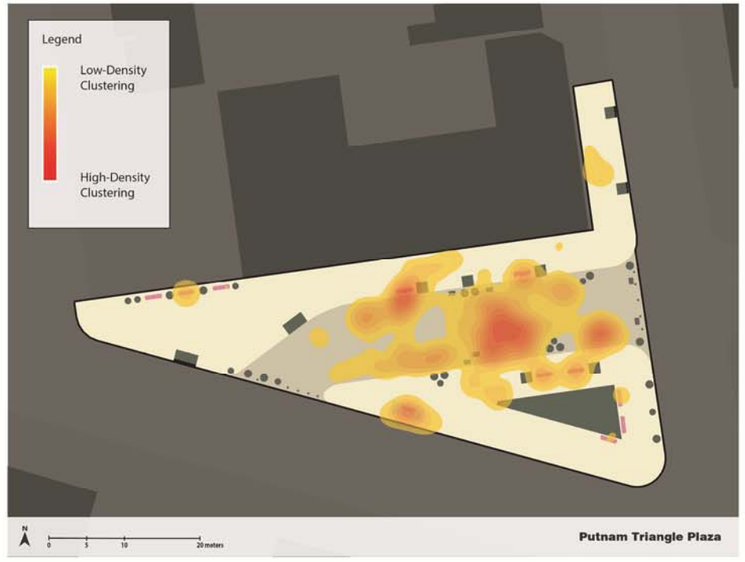
where *x* equals a given point, *n* equals the number of independent observations, *K* is the kernel, and *h* is the established bandwidth, or radius of measurement.[27] The bandwidth of the kernel density function (*h*) relates to the radius within which points are analyzed and kernels interpolated. A finer bandwidth (fewer feet in radius) yields more concentrated kernels, whereas a broader bandwidth (wider radius of observation) yields a more general picture of location patterns. Since the two spaces differ so much in size, a different bandwidth was selected for each. For Putnam Triangle a bandwidth of 10 feet was chosen, and for Cuyler Gore a bandwidth of 20 feet was chosen. The kernel density output displays as a raster—i.e. a continuous grid of cells—and the value at each cell represents an interpolation of the likely density of people at that location. For the purposes of this presentation, the cells have been classified into intervals (lowest clustering to highest clustering), and these intervals are visualized by a gradient scale of yellow-to-red. The spaces with no or little clustering are rendered transparent so that hot spots would be more easily visible. The densest kernels are rendered dark red.

[27] B.W. Silverman, *Density Estimation for Statistics and Data Analysis* (London: Chapman and Hall, 1986), 76.

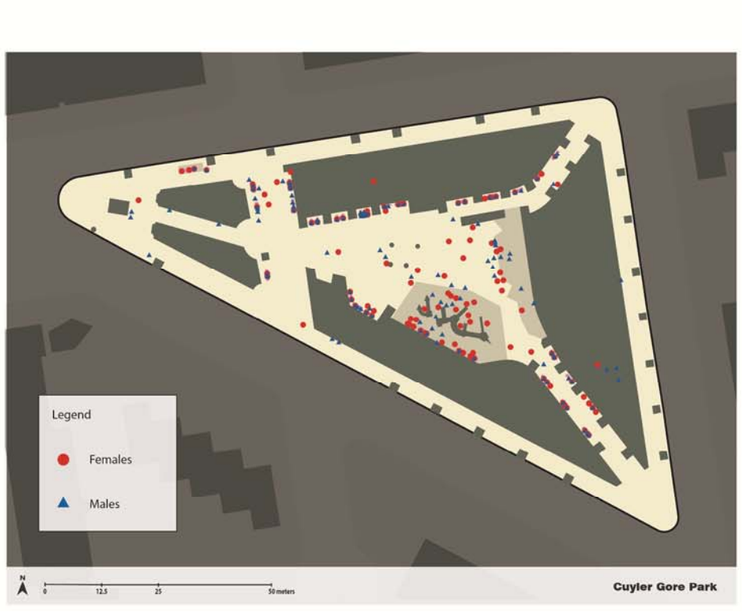
Putnam Triangle Plaza

All Observed Points

Heat Map of All Observed Points (Kernel Density Analysis)



Cuyler Gore Park



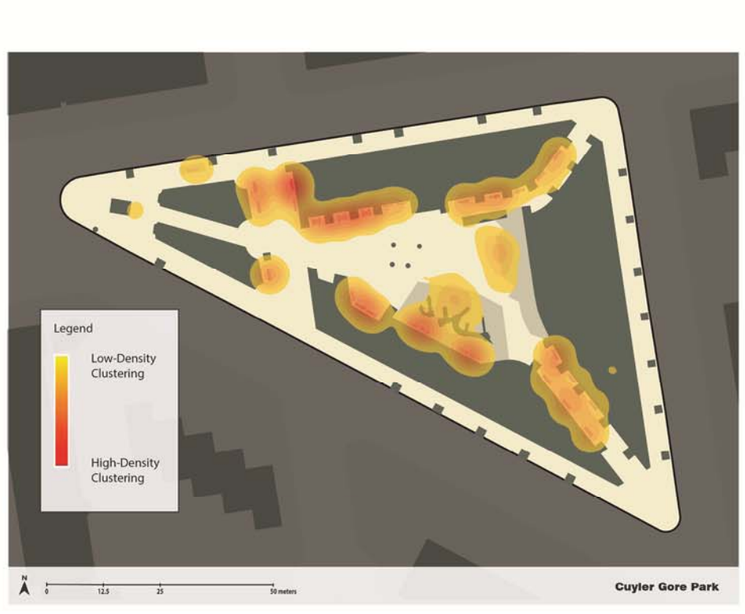


FIGURE 4.1: POINTS AND HEAT DENSITY MAPS: ALL OBSERVED PARK USERS

These maps display the total population of all points observed at the two spaces. The heat density maps on the right show the clustering activities across all time periods and both genders.

Hour-by-Hour Analysis

On average, the number of people using the park spaces during the weekdays climbed as the day progressed. Weekday evenings had the highest park usership, while weekday mornings had the lowest. Usership during midday hours was about equal on both weekends and weekdays. It was assumed that 10am to 2pm on the weekends would represent the hours of peak usership, but results suggest usership might continue to climb into the evening. At Putnam Triangle, the highest usership was observed during the early evening hours of the week. Midday weekend usership was higher on average than morning or midday time periods during the week. At Cuyler Gore, usership tended to climb as the day gets later. On both weekend and week days, the average number of users per hour increased steadily. The peak was 41 users on average during the hour of 4pm during the week.

The kernel density analysis at Cuyler Gore shows that in the morning there is activity toward the center of the park. This finding is explained by the observation of elderly individuals exercising in the park early in the morning, practicing tai chi and yoga. Mid-day and evening activities tend toward the perimeter spaces where the benches lie, and in the evening there is a kernel surrounding the bus station at the northwest curb of the site. Cuyler Gore exhibits greater clustering near the playground area in the afternoon and evening, when parents are more likely to visit with their children.

At Putnam Triangle Plaza, user dispersion seems to move northward as the day progresses. In the morning, there is a noticeable grouping of people at the bus station in the south-central part of the park. There are also clusters surrounding the benches around the landscaped triangle near the south end of the park, where people take advantage of the early-morning shade afforded by the trees and bushes. Midday users are concentrated toward the center of the park, under umbrellas. In the evening, people seem to be clustered toward the north end of the space, where the building faces cast shade across

the park. At Putnam Triangle, it seems daily usage patterns are contingent on sun/shade movement.

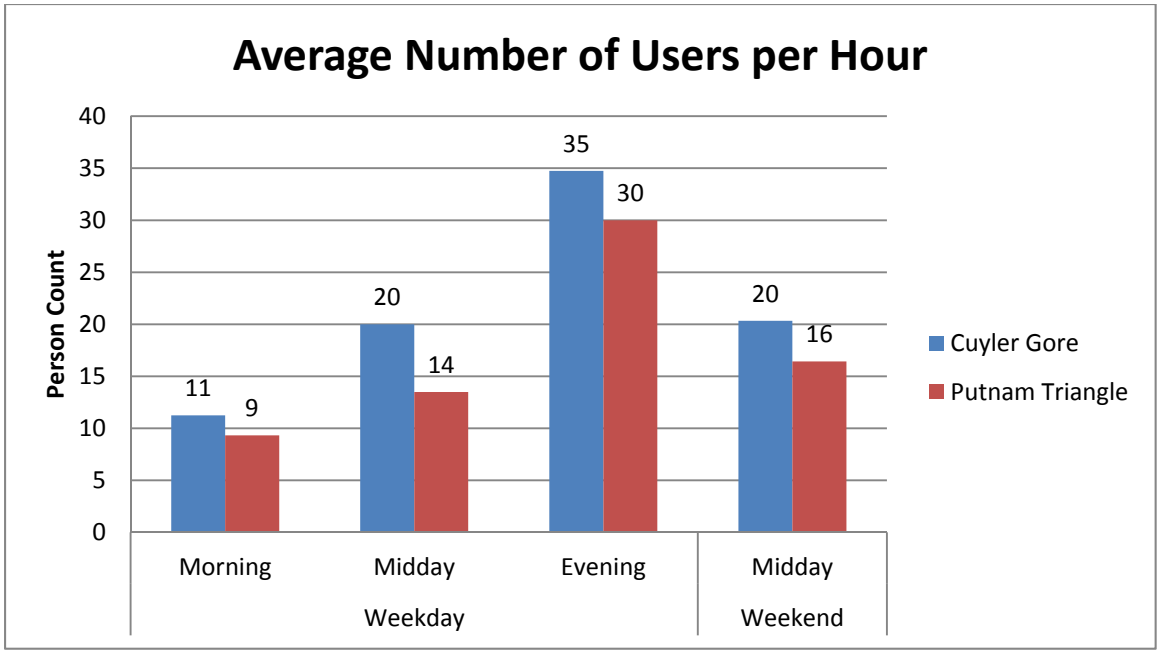


FIGURE 4.2: AVERAGE NUMBER OF USERS PER HOUR

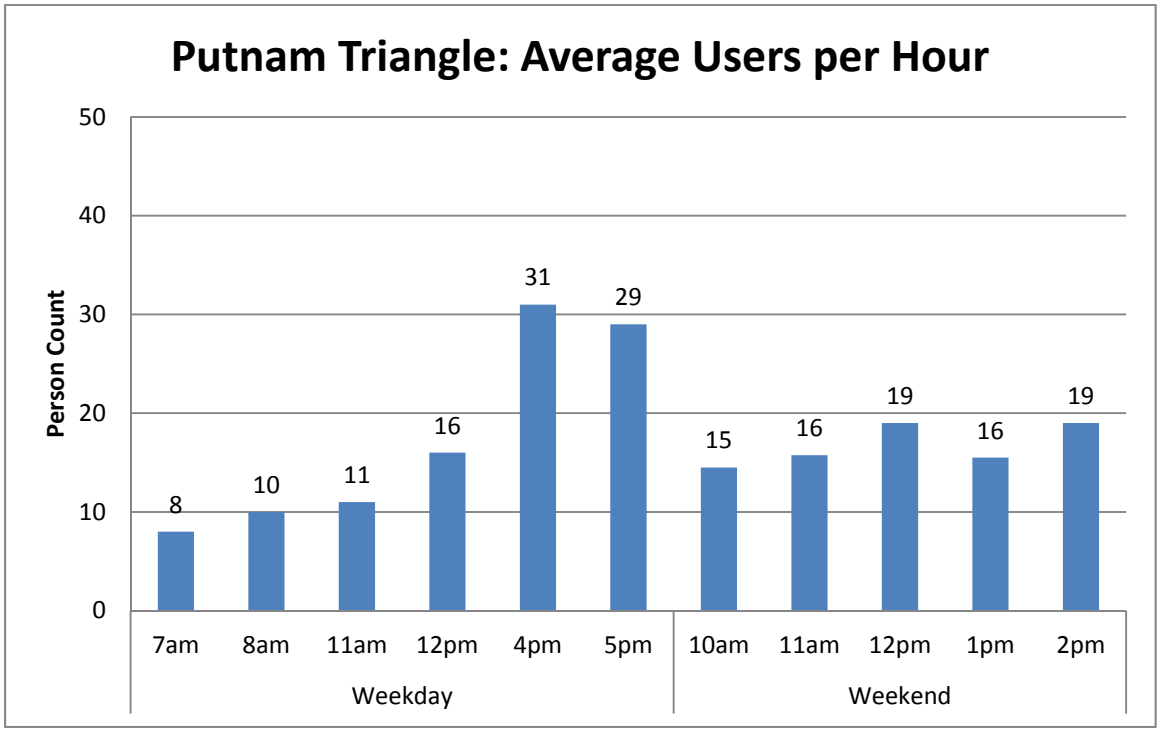


FIGURE 4.3: AVERAGE NUMBER OF USERS PER HOUR: PUTNAM TRIANGLE

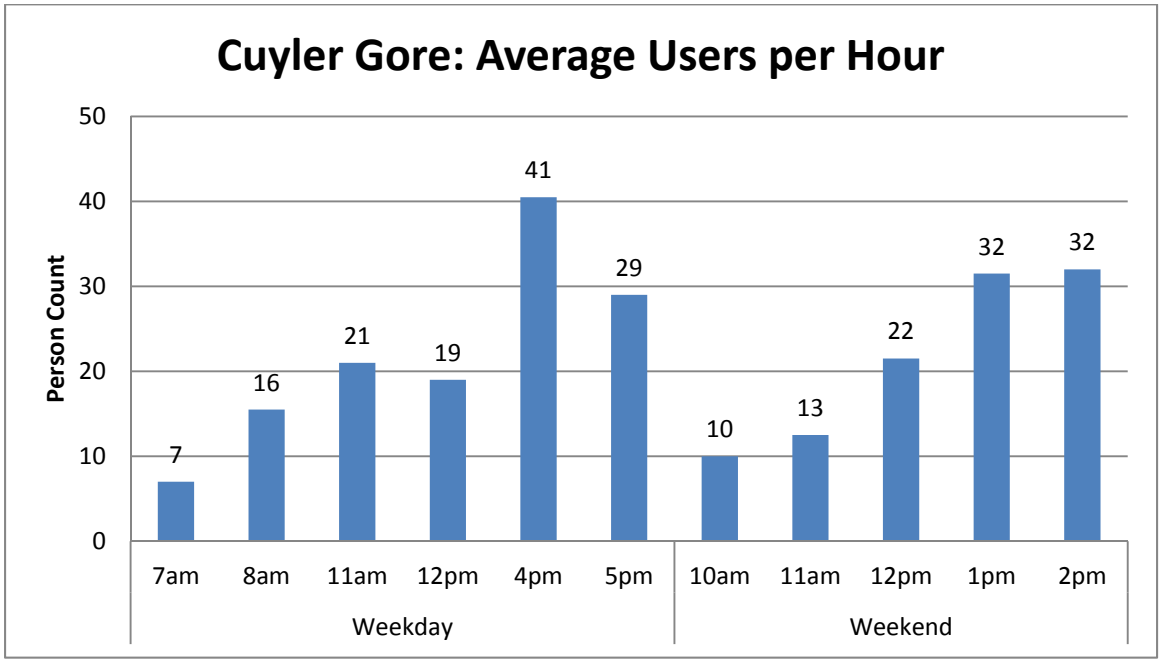
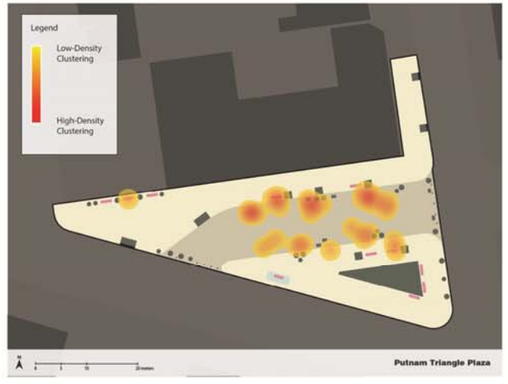


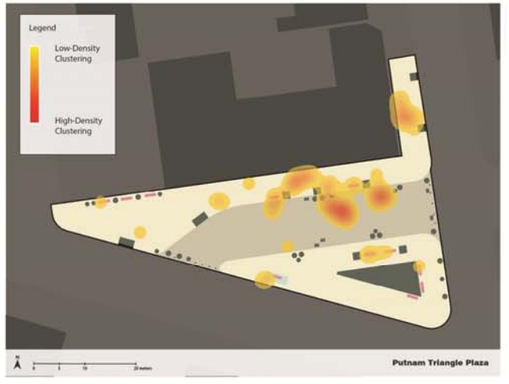
FIGURE 4.4: AVERAGE NUMBER OF USERS PER HOUR: CUYLER GORE

Putnam Triangle Plaza

Weekday Mornings (7-9am)



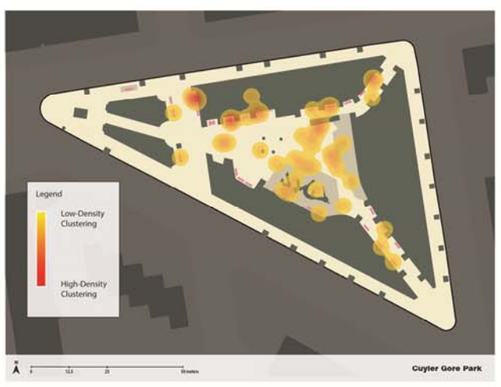
Weekday Midday (11am-1pm)



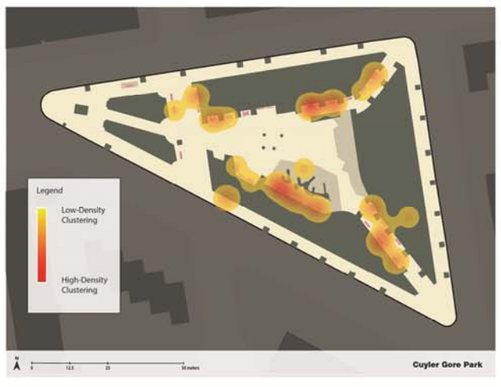
Weekday Evenings (4-6pm)

Weekends (10am-2pm)

Cuyler Gore Park

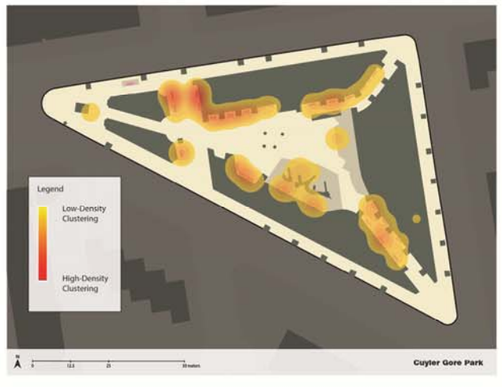


Weekday Mornings (7-9am)



Weekday Midday (11am-1pm)

Weekday Evenings (4-6pm)



Weekends (10am-2pm)

FIGURE 4.5: HEAT DENSITY MAPS: HOUR-BY-HOUR ANALYSIS
These maps display clustering activities at both parks based on the time of day.

Seated v. Standing Analysis

TABLE 4.2: GENDER BREAKDOWN

	Cuyler Gore	Putnam Triangle
	# of people observed	
Standing	85 (21%)	85 (25%)
Seated	322 (79%)	260 (75%)
TOTAL	407	345

Not surprisingly, standing park users were more dispersed in both parks than seated users. This is likely because standing users are more likely to move around and to be pulled toward or away from other people in the park. Seated users are more likely to stay put, even when other users crowd around them. Not surprisingly, seated users are more dispersed in Putnam Triangle, where moveable seats allow users to better select their location. Seated individuals in Cuyler Gore have no choice but to select one of the immobile benches that line the perimeter of the open space.

At Putnam Triangle, the vast majority of users were observed seated on moveable chairs or benches. Users were not observed sitting in wheelchairs or on secondary seating. During the midday hours there is a higher proportion of seated individuals, probably explained by the extreme heat coming off the pavement during the day. The seating/standing trend at Putnam may also be explained in part by the bus station, where people would stand waiting during their morning commute, and it may correlate with the opening/closing hours of nearby community centers and places of work.

At Cuyler Gore, there is also a higher proportion of users standing in the morning. This probably reflects exercise schedules, and a number of elderly individuals, especially Asian, were observed stretching, doing tai chi, or otherwise exercising in the park in the morning. At other hours park users are most likely to be sitting on benches. At some hours people were observed seated in wheelchairs or on secondary seating.

On average, 75% of park users were seated in “official” designated seating, including benches and chairs. In Putnam Triangle, the remaining 25% of park users were standing, while in Cuyler Gore 21% of park users were standing and 5% were seated either in secondary seating or in a wheelchair. Interestingly, males were more likely to be seated than females. This statistic may be the result of the child activity observed in Cuyler Gore where females were observed standing and playing with children in the playground.

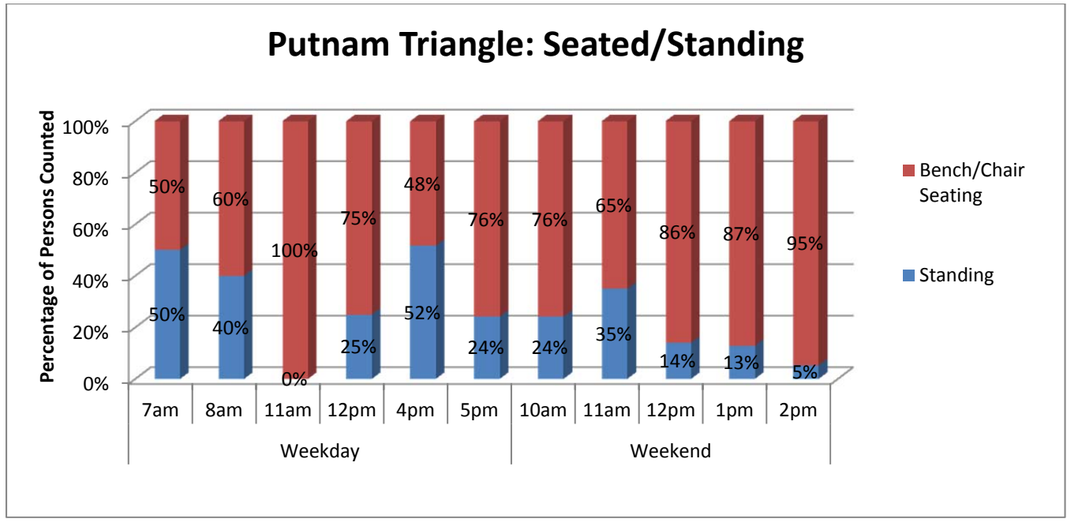


FIGURE 4.6: PUTNAM TRIANGLE: SEATED V. STANDING

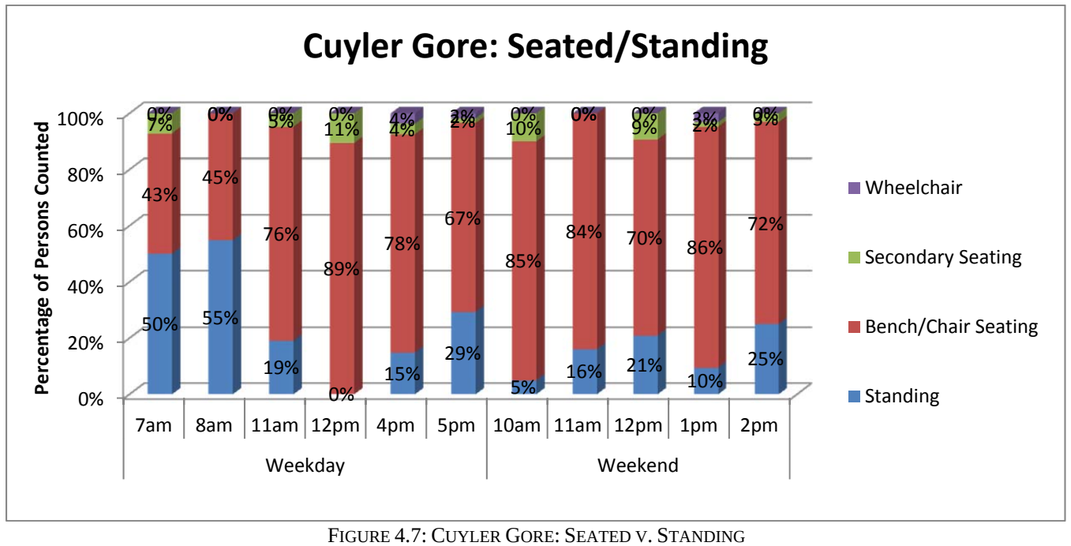


FIGURE 4.7: CUYLER GORE: SEATED V. STANDING

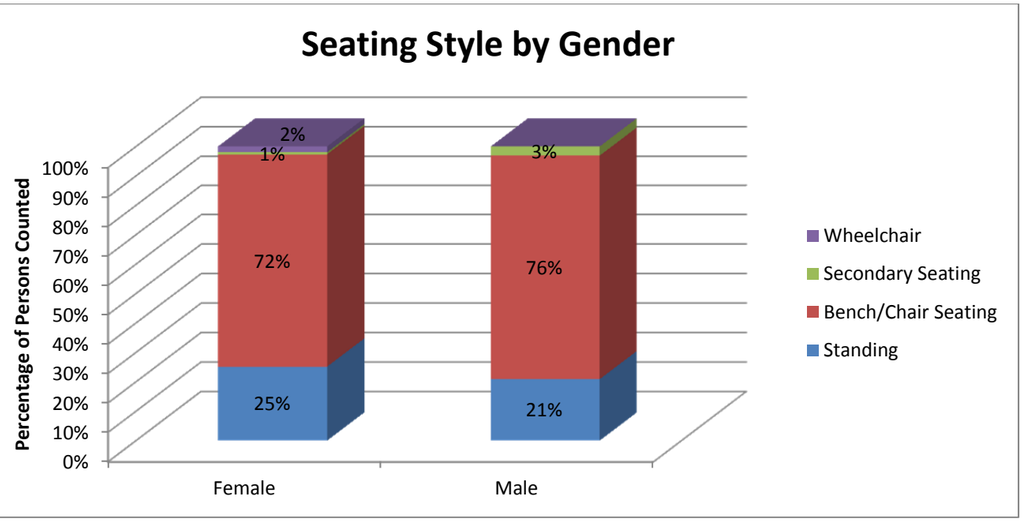


FIGURE 4.8: SEATING STYLE BY GENDER

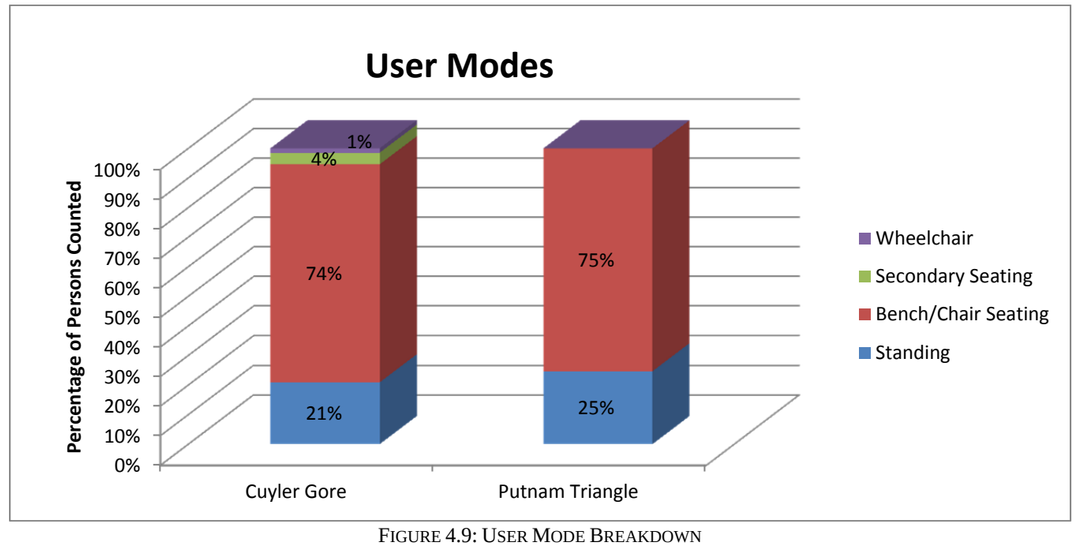
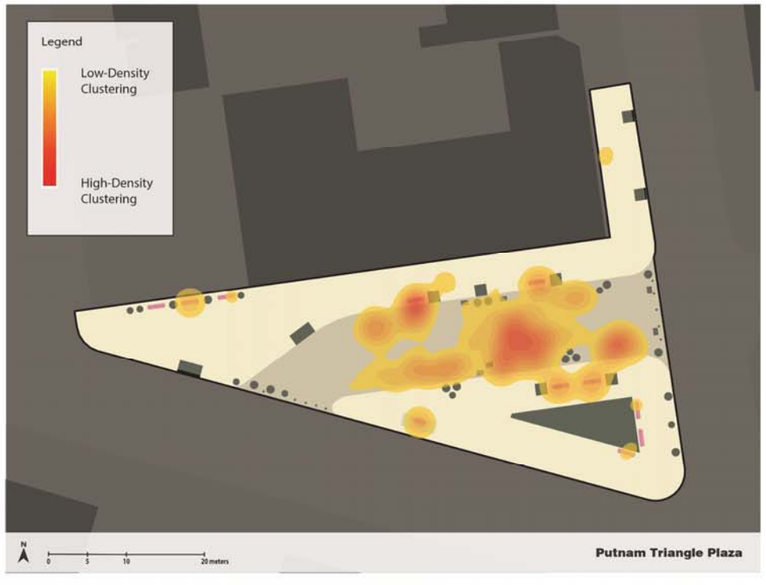


FIGURE 4.9: USER MODE BREAKDOWN

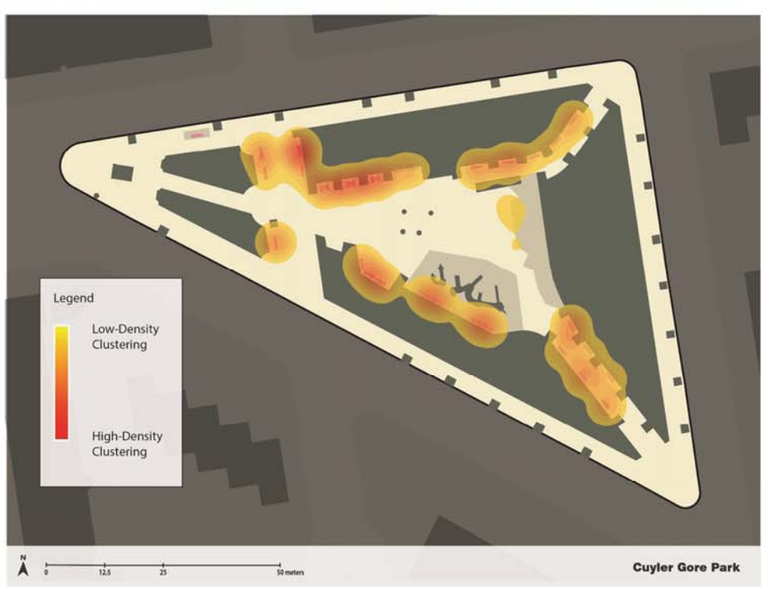
Seated Park Users

Standing Park Users

Putnam Triangle Plaza



Cuyler Gore Park



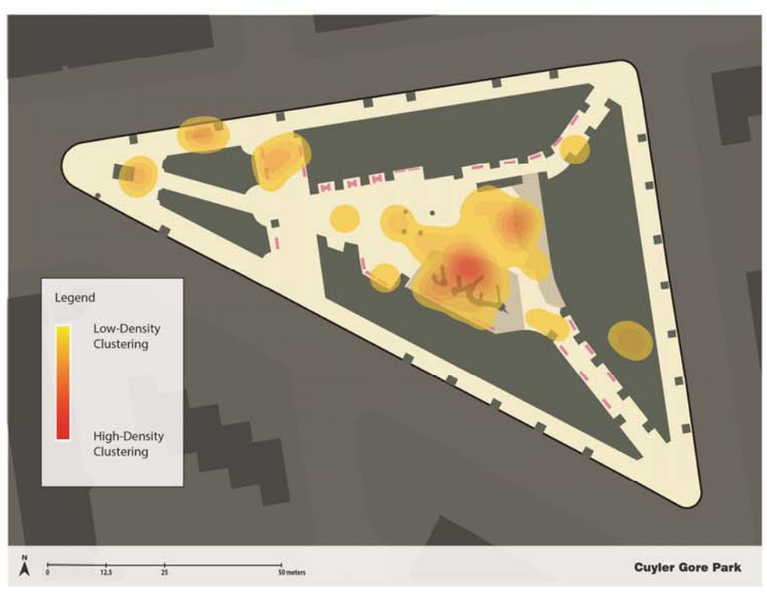


FIGURE 4.10: HEAT DENSITY MAPS: SEATED V. STANDING ANALYSIS
These maps display clustering activities at both parks, separated for users who were either seated or standing.

Analysis by Activity Type

Since it is possible for one activity to be engaged in two activities at once (e.g. eating and socializing; physical activity and child activity), individuals were sometimes double-counted. In addition, activity data was not geocoded since the process of mapping these individuals would be too time-consuming on site. Therefore, activity counts cannot be represented by percentages, and they are not able to be analyzed through a kernel density map. Nonetheless, it is still possible to see which activities are prevalent in the two spaces at different hours. Within Putnam Triangle, the predominant activity during evening hours and on the weekend was socializing. The peak hours for socializing were between 4-6pm during the week, when on average 16 individuals were found socializing at a given time. Other common activities observed in Putnam included passive games and eating/drinking, which were especially popular during the evening hours of the week. During weekday mornings, Putnam Triangle was used by commuters who wait for the bus downtown. It is interesting to note that significantly more individuals were observed in Putnam Triangle to be engaged in *social* activity than in *solitary* activity. Compared with Cuyler Gore, there was almost no child activity taking place at Putnam Triangle. On average 0-1 individuals were observed engaged with children at any given hour, compared with Cuyler Gore where during the evening an average of 11 adults were observed engaging children.

Cuyler Gore Park is used by visitors for a variety of activities, ranging from the social to the solitary. Child activity was a common activity observed during the week, at midday and during the evening. Groups of daycare children were observed with their attendants during the midday hours, while the evening hours were predominated by parents. In part because of the high level of child activity during the evening, Cuyler Gore was observed to be a very social space during these hours, with 16 individuals on average engaged in social interaction. Solitary activity was observed during all hours, and was especially prevalent in the park midday during the week. Many of these solitary

individuals were occupying park benches, relaxing in the shade. There were no observations taken of people engaged in passive games at Cuyler Gore, but people were observed exercising in the park during weekday mornings. Despite its proximity to many great restaurants, not many people were observed eating in Cuyler Gore. Though it would seem Cuyler Gore would be an attractive place to enjoy lunch, only two people on average were observed eating food during each lunch-hour visit. This may represent an opportunity for the space—to expand its attractiveness as a place for taking meals, either solitarily or with colleagues and friends.

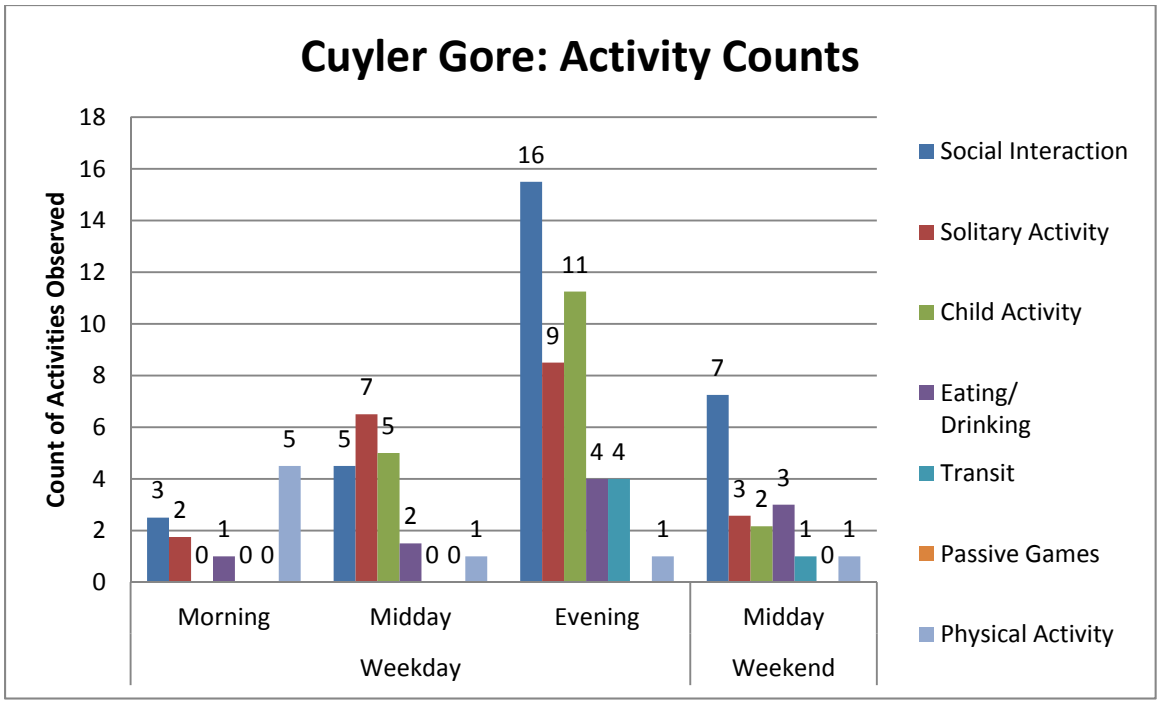


FIGURE 4.11: CUYLER GORE ACTIVITY COUNTS

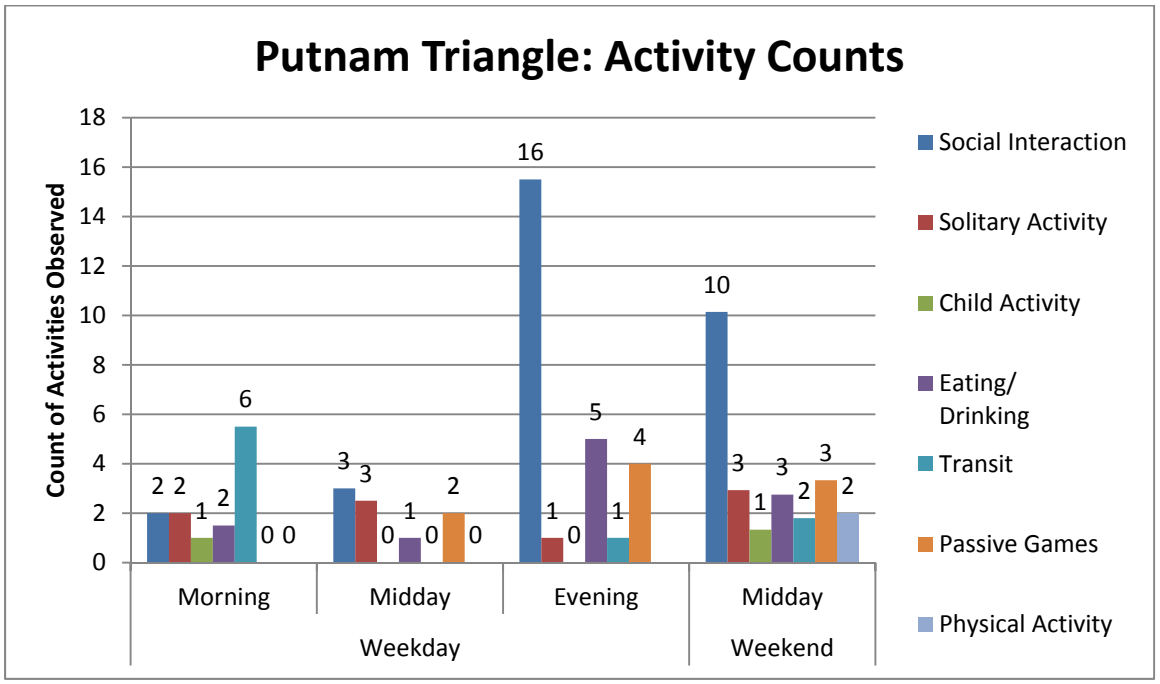


FIGURE 4.12: PUTNAM TRIANGLE ACTIVITY COUNTS

Gender Analysis

TABLE 4.3: GENDER BREAKDOWN

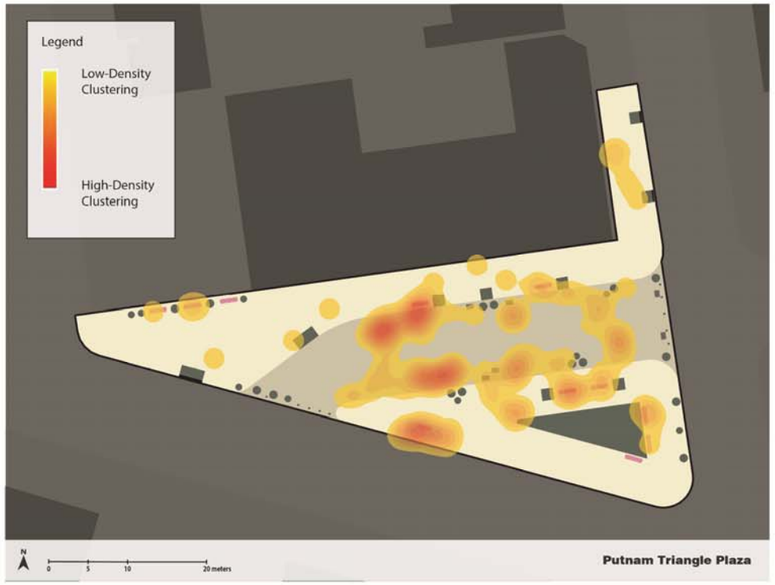
	Cuyler Gore	Putnam Triangle
	# of people observed	
Female	202 (50%)	100 (29%)
Male	205 (50%)	245 (71%)
TOTAL	407	345

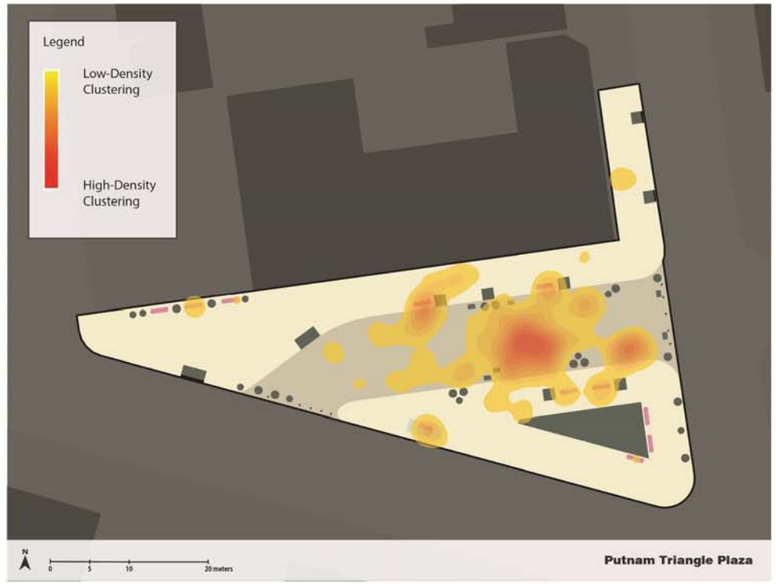
Males and females were split out for separate kernel density analyses. It is important to note first that, while the observations at Cuyler Gore were split 50/50 male-female, at Putnam Triangle, 71% of people observed were male. Putnam Triangle was usually occupied by a community of males who socialized actively and seemed to use the plaza as a meeting space. Despite, or because of, the two very different gender splits, the point pattern analysis of the two parks based on gender yielded interesting results. At Cuyler Gore, females are concentrated in and around the playground area, while men are concentrated in the seating areas to the north. Men and women both seem to use the benches that line the entryways to the park. At Putnam Triangle, an even more interesting clustering phenomenon seems to occur. At Putnam Triangle, the men seem to dominate the space. There is a strong clustering of men at the center of the park, where it is popular for groups to pull up tables and chairs, talk, and play games. Women, by contrast, seem to be more dispersed. They cluster around the periphery of the core group of men, and are more concentrated to the west. There also seems to be a stronger female cluster around the bus stations at each park. Men and women are observed to be using these spaces differently.

Female Park Users

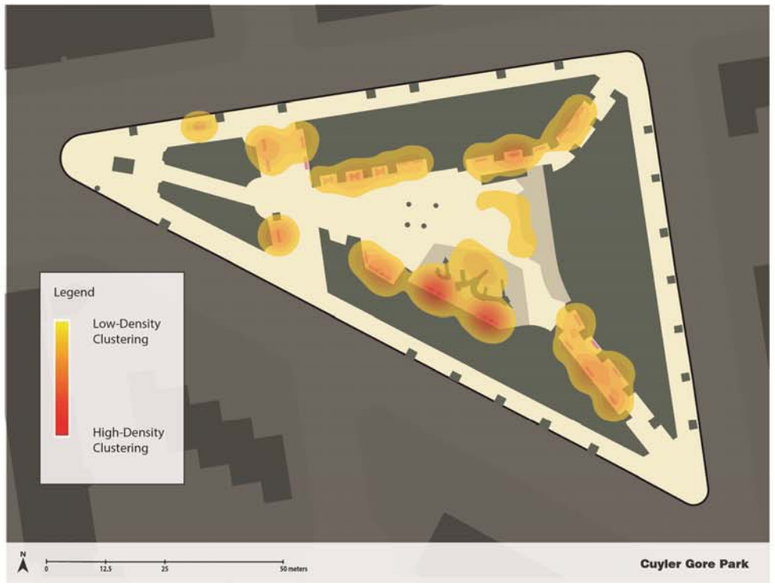
Male Park Users

Putnam Triangle Plaza





Cuyler Gore Park



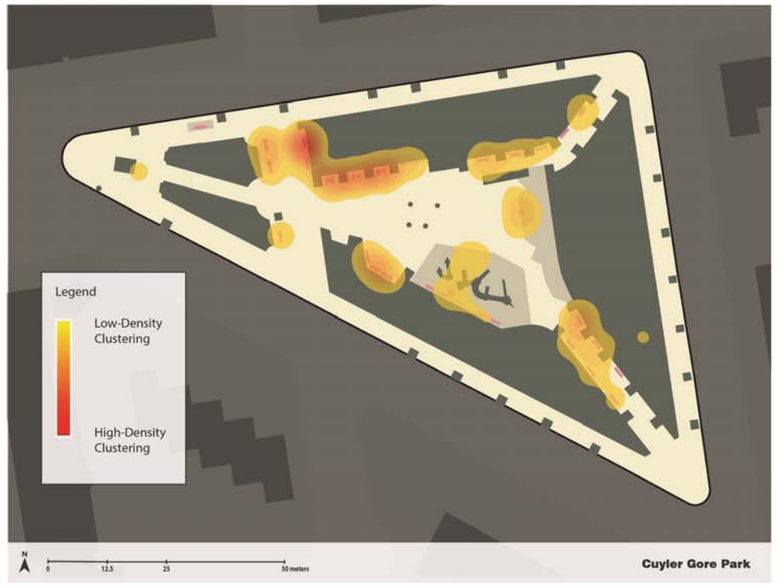


FIGURE 4.13: HEAT DENSITY MAPS: GENDER ANALYSIS
These maps display clustering activities of males and females.

Race/Ethnicity Analysis

Both Putnam Triangle and Cuyler Gore were observed to be predominantly occupied by African Americans. At Cuyler Gore, 54-71% of observed persons were African American, while at Putnam Triangle the ratio climbed as high as 92% midday during the week. Aside from African Americans, the most common demographic group was Caucasian. Caucasians were observed in higher proportions at Cuyler Gore than at Putnam Triangle. Hispanics and Asians were in the minority at both spaces, though a contingent of elderly Asian Americans was repeatedly observed exercising in Cuyler Gore Park during the early morning hours.

Cuyler Gore and Putnam Triangle both seem to be used heavily by African American community members, especially when compared with the percentage of the black population the surrounding neighborhood. 50-92% of park users at Cuyler Gore and Putnam Triangle were observed to be black, yet in Community District 2—the neighborhood region in Brooklyn in which these park spaces reside—only 28% of residents identified as African American on the 2010 U.S. census. Although 46% of local residents identified as Caucasian, at the park spaces Caucasians made up 0-21% of all park users, depending on the hour. In addition, though 14% of community members report as Hispanic, generally less than 10% of park users were observed to be Hispanic.[28] This finding suggests that neighborhood public spaces are especially valued by African American community members, many of whom may have been living in the neighborhood and using the parks for a longer time.

[28] This trend may be partly explained by the fact observers were making a judgment based on sight as to whether park users were Hispanic or not. Perhaps some Hispanic-identifying individuals were not recognized as such by the observers.

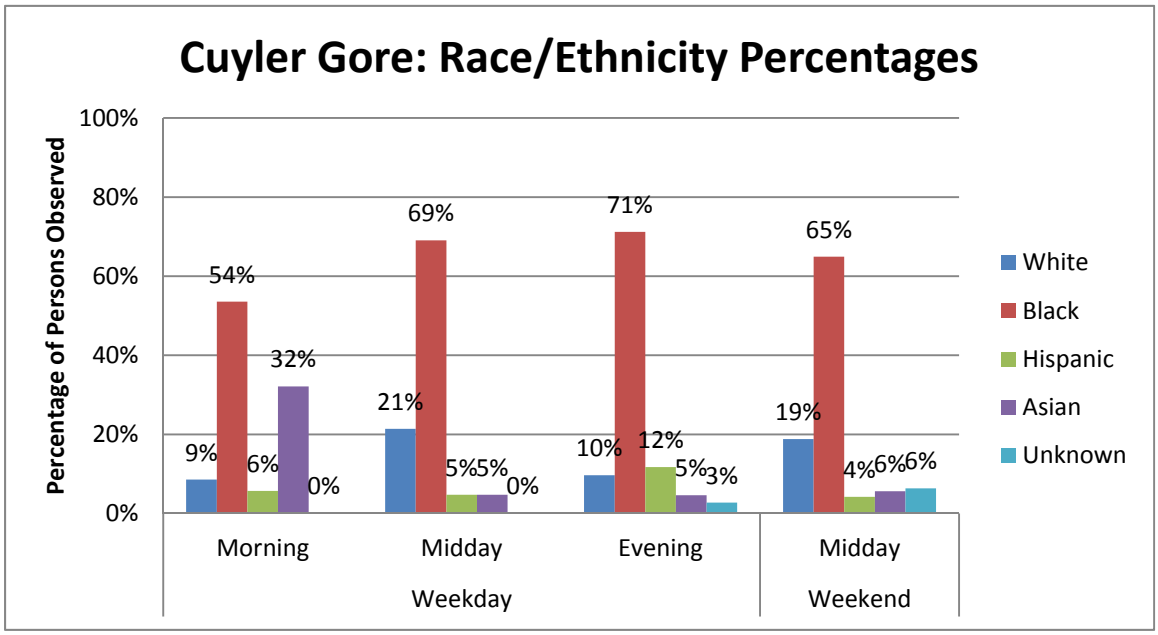


FIGURE 4.14: CUYLER GORE: ETHNICITY PERCENTAGES

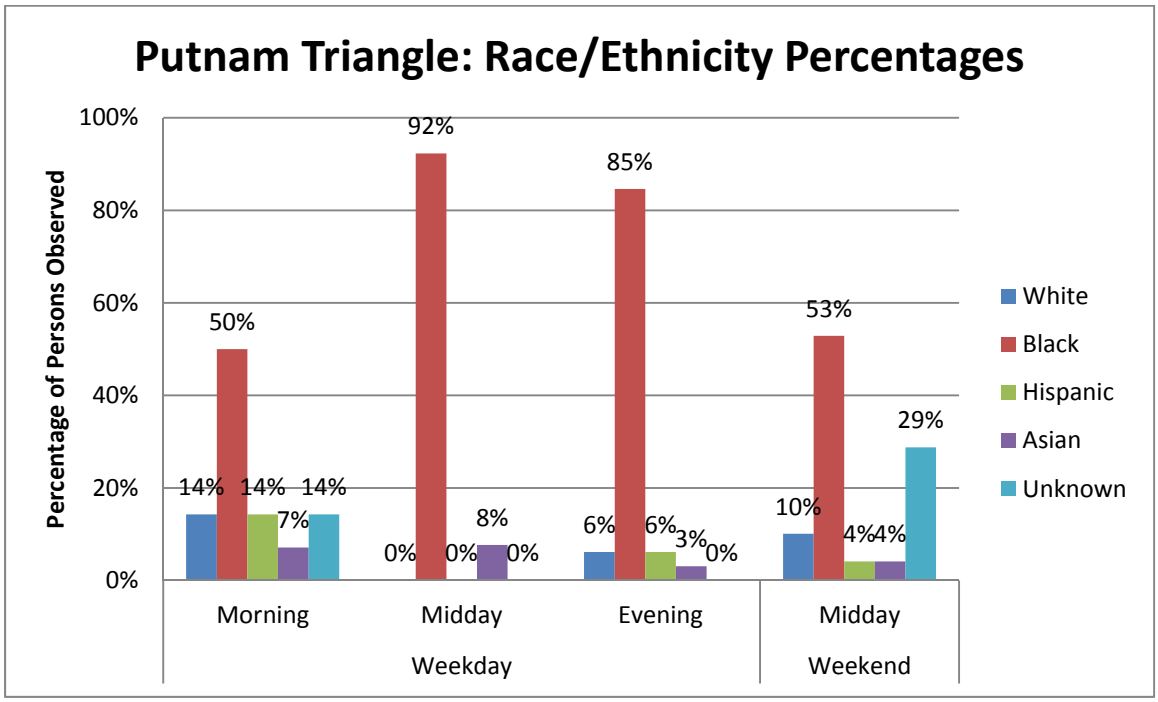


FIGURE 4.15: PUTNAM TRIANGLE: ETHNICITY PERCENTAGES

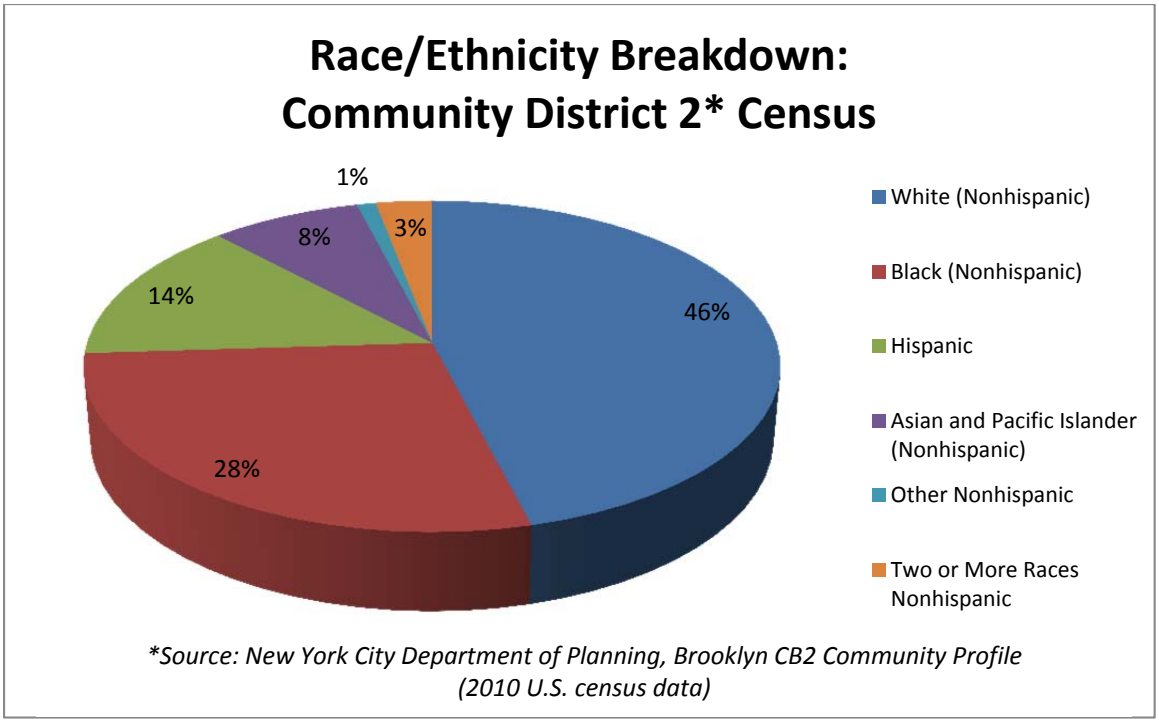


FIGURE 4.16: ETHNICITY BREAKDOWN: COMMUNITY DISTRICT 2

Age Group Analysis

Cuyler Gore and Putnam Triangle were both observed to be predominantly occupied by adults (ages 30-65). Notably, at Putnam Triangle 55-77% of occupants were mature adults. The second most common age group at Putnam Triangle was young adults (age 20-30). Seniors were observed at Putnam at all hours except midday during the week. Teens and children were very little represented, but were more commonly observed during early-morning hours of the week. At Cuyler Gore the picture was more complex. Though mature adults still comprised as much as 30-50% of park users, children were sometimes just as, or more, prevalent. During midday hours during the week, for instance, more children occupied the space than adults, and during weekday evenings the percentages were about equal. Teens were most often observed using Cuyler Gore during weekday evening hours. Young adults were found to comprise about 10-17% of park users at any given hour. Seniors were more commonly observed during morning hours.

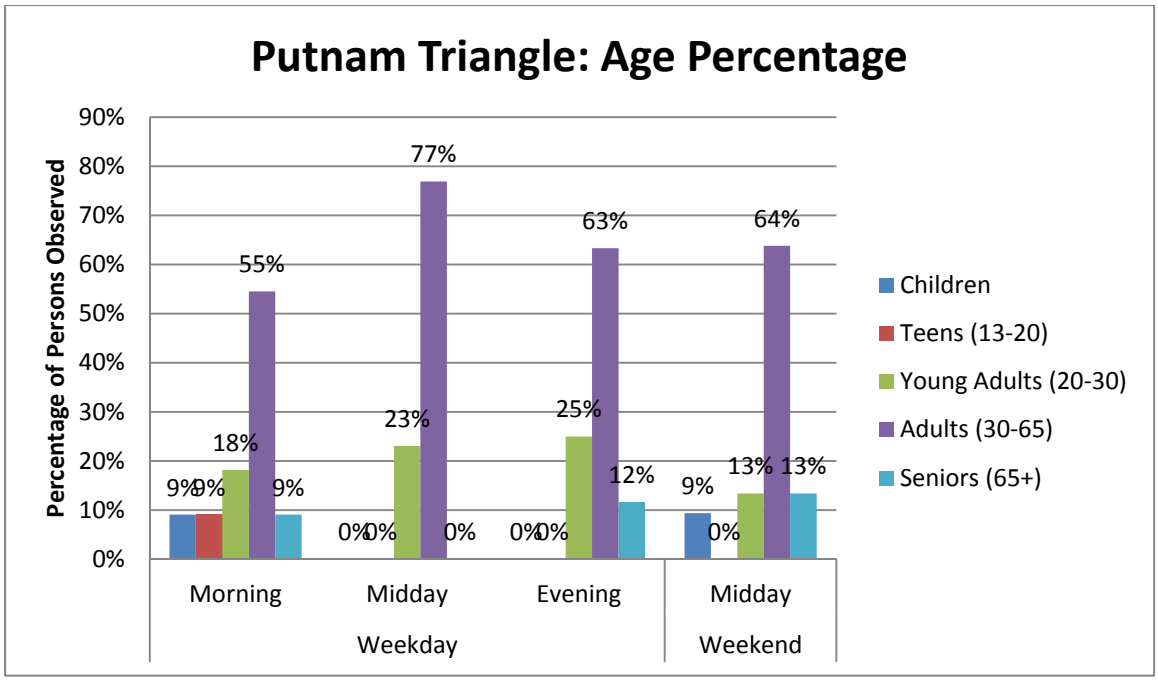


FIGURE 4.17: PUTNAM TRIANGLE: AGE PERCENTAGES

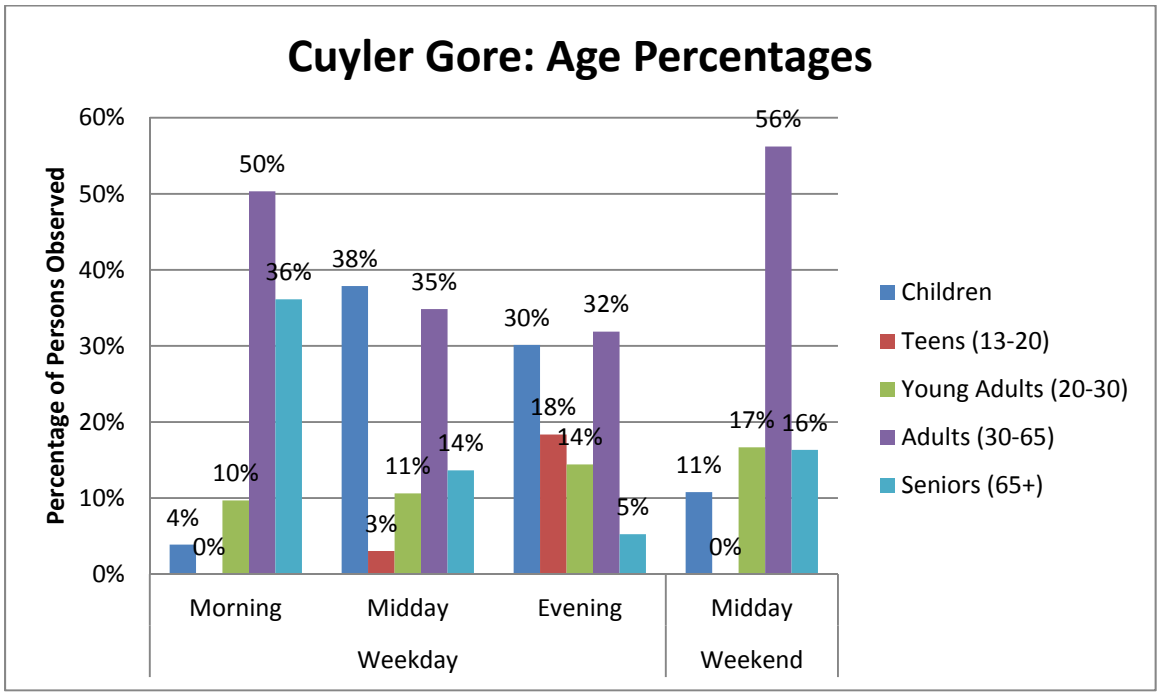


FIGURE 4.18: CUYLER GORE: AGE PERCENTAGES

5 CONCLUSIONS

The FAB community's use of these two park spaces seems to be responsive to the parks' design to some degree. Cuyler Gore is a larger park, enclosed from the street and shaded by great trees, whereas Putnam Triangle is pocket-sized, hot and exposed. The design of Putnam Triangle seems to attract more socialization, evident in the percentages of users engaged in *social interaction*, as opposed to *solitary activity*. In Cuyler Gore, on the other hand, the size of the park and the detached and solitary configuration of the bench spaces contribute to higher proportions of solitary activity. It is clear from the kernel density analyses that park users, true to William Whyte's word, locate according to the seating available.

The direct observation data and spatial analysis of these two park spaces has helped to draw the following conclusions:

- Usership climbs as the day progresses. Analysis based on **time** shows that the most popular time to visit either park is evening hours during the week. It is likely that were counts conducted later in the day on weekends, higher user volumes would have been discovered.
- Park users are more likely to be found **standing** during the early morning and evening hours. Midday, more individuals are **seated**, likely because of the heat and because the park is used as a resting space. Park users locate according to the seating available. Moveable chairs result in a greater dispersion of park users. Fixed benches are popular seating areas when available, as is the case with Cuyler Gore; however, when users have the option of sitting in fixed benches or moveable chairs, as in Putnam Triangle, they seem to choose the moveable chairs.[29]
- Putnam Triangle has evinced an unusual **gender** balance of 70/30 in favor of males, and in this park space males seem to dominate the center of the space while females congregate at the periphery. It is difficult to determine whether this

[29] This may be because the benches in Putnam Triangle are less comfortable than those in Cuyler Gore.

dispersion of females is the result of sheer numbers, or the effect of some sort of social interaction inherent to the group observed. At Cuyler Gore, gender dispersion is more even, but females cluster near the playground.

- **Ethnicity** dynamics are pronounced, especially compared with the profile of Community District 2. Both park spaces are used predominantly by African American community members. Caucasians and Hispanics are less prevalent in the park spaces than might be expected from the demographic profile of the area. There is a community of elderly Asians who use Cuyler Gore in the mornings to exercise.
- Both park spaces are used predominantly by mature adults (30-65 years old). Otherwise Cuyler Gore is used by a wider variety of **ages**. Seniors, children, and teens are all more likely to be found using Cuyler Gore than Putnam Triangle.
- **Activities** at both park spaces are various, but the dominant activity is social interaction. At Cuyler Gore, people are more likely to be engaged in solitary activity, physical activity, and child activity. At Putnam Triangle, people are more likely to be engaged in passive games.
- Location patterns seem to follow **sun/shade** movement, and during warm summer months it is important to provide shady areas to sit and relax.

The study of park spaces using direct observation and advanced spatial techniques is a worthwhile pursuit, when stakeholders are looking to build a space that both serves the needs of the local community and has attractions for visitors and guests. The paucity of such studies may result, first, from the considerable expense and time needed to carry out even simple observational research. Advanced spatial analysis techniques may be overly rigorous for the question of designing a small urban park. Second, advanced spatial analysis using park user data is undermined by inaccuracies in the data itself. Point data often lacks the locational accuracy needed to be confident in deducing statistically significant patterns. Errors in location accuracy may stem from the process of recording data by hand, and in the transcription process from paper to digital. In the current study,

however, the focus is on determining general user profiles rather than determining the precise locations for social phenomena.

The current study does not help address the question of how long park users occupy a space, but a more qualitative observational study could. One would assume Cuyler Gore would be better suited for longer visits, since it is larger, cooler, and there is more to do. With further observation, perhaps it would be found that people visit Cuyler Gore with their children, letting them play while they sit to read a book for the course of an hour. Perhaps it would also be found that people are likely to sit at a table in Putnam Triangle for a few minutes only to check their phone or eat a slice of pizza, then walk off to resume their business. Indeed, these seem to be the uses for which these spaces are designed. Anecdotal observation has shown otherwise, however, at least with respect to Putnam Triangle. Volunteers assisting with data collection at the park spaces observed that the users at Putnam Triangle tended to stay there for a long periods of time, sometimes hours. This observation reveals that parks are not always used as expected, and that there are good reasons for supplementing quantitative data with qualitative data. This qualitative data can be procured through surveys, interviews, focus groups, or descriptive observation exercises, and can help to contextualize the results of quantitative studies.

It would be interesting to compare user dynamic at Putnam Triangle with those of other DOT plazas, such as Fowler Square. At Putnam Triangle there was a single dominant user group that was observed to be occupying the space continuously: a community of largely African American males who congregated daily to socialize, eat, and play games. This user group is unique to Putnam Triangle, and is heavily represented in the data collected and presented here. For this reason, the findings from Putnam Triangle cannot be generalized to other DOT plazas around the city. It is important when working with observational data to draw only tentative conclusions about the user profiles at park spaces. Spaces need to be studied individually to determine the

usage patterns unique to that space. Generalizations made about the totality of park spaces (e.g. all DOT plazas) from data collected at a single space can be only suppositional.

Findings from this study can help the FAB Alliance and other community groups identify strategies for public space design in the coming years. It is important for community organizations to lay out strategies to perform observational studies at regular intervals to remain current with the user dynamics of urban public spaces. It is possible that this research could be conducted in an abbreviated form, with fewer samples taken at less expense. Since the study intends only to gain a general impression of usage patterns, and since conclusions can only be drawn with so much confidence, perhaps a tactic of regular, short tests would be best for tracking the continued usage of the parks. Repeated park studies could be compared against one another, and against the evolving demographic profile of the surrounding community. Such comparisons would be useful for noting the effects of gentrification on neighborhood's public spaces. For a neighborhood association such as a BID, this data would be important in weighing priorities such as economic development, public space environment, and social equity.

This study introduces questions about the design intentionality, and how organizations can use data collected on park spaces to create more successful, more accessible parks. In short, what should an organization do with observational data, once collected? Park data can be used to draw inferences about the potentials and limitations of the spaces as currently configured. For example, the limited number of children observed in Putnam Triangle suggests that parents do not believe it to be a safe place to bring their families. Such a finding reinforces the need for other play areas within the FAB district, and might encourage the organization to strengthen child-friendly infrastructure at a larger, safer space like Cuyler Gore. Data can be presented by FAB at community meetings, or at closed-door meetings with city officials, to strengthen the case for certain developments.

The methodologies and results presented herein show that an enormous amount of information about places can be gathered by simply watching. Observational studies require little preparation and relatively low expense, and they produce data that is fresh every time. A small organization like a BID can easily carry out observational studies of its open spaces, and it can design the study to suit its unique needs. While the current study took a more systematic and tabular approach to documenting park spaces, other studies could approach it more qualitatively through the use of community surveys, workshops, and interviews. It is highly recommended that government agencies and community organizations consider ways in which empirical methodologies can boost their understanding of their shared spaces, and help them strategize their design for long-term use.

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